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STOP PRESS

ISSTIP WORKSHOPS AND CONFERENCES

Nov. 24 **One-Day Workshop** on 'Tensions and Performance in the Orchestra' Goldsmith College, London SE14 (by kind permission of Music Dept.).

Jul. 21-25 **Isstip Conference 1986** at Westminster Choir College (Five-Day Workshop on 'Exploring Physical and Psychological Tensions in Performance').

Aug 24-29 **ISSTIP** in Conjunction with Mind, Body and the Performing Arts Conference, in London.

In this issue of the journal, the editors have completed publication of proceedings of the Second International Conference from which some contributions were published in Journal No. 2.

In future we shall publish some of the presentations from ISSTIP seminars. In line with this policy, we include in the journal an article by Ms Samana on "Stress and the Musician" based on demonstrations of her technique for relieving tension designed to help performers of all kinds.

One memorable presentation was that by Dr. Malcolm Carruthers on autogenic training in which attention is directed inwards by focussing the mind on verbal formulae relating to different parts of the body. He reminded the audience that the six basic exercises developed 50 years ago can be practised three times daily to replace other therapies including tranquillizers.

Another fascinating presentation was that by Robinne Commissioner under the title "Pulling the Energy Cord" in which she described how stress energy can be released to enhance performance.

This summer there was a further meeting of ISSTIP at Westminster Choir College in Princeton, New Jersey. Manuscripts have been obtained from at least one contributor, Mr. Hunter Fry, whose article on 'Overuse injury' is published in this issue.

Interest in the stress of performers continues to grow and this autumn will see an all-day meeting at Goldsmiths College on the topic of stress and performance in orchestral musicians and conductors.

The Lancet, which is the oldest medical journal published in the United Kingdom, has run a series of leading articles on the medical problems of performers to which members of ISSTIP have contributed. One leader on the medical problems of dancers based on Dr. Richard Pearson's lectures, has led to the organisation of a study day at the Centre for Dance Studies at the University of Surrey at Guildford to be held on 15th February, 1986.

The problems of the performing artist can be immense. The uncertainty of employment in these most difficult times add to the usual difficulties of career development. It is very refreshing that more and more music colleges and dance schools are teaching students about techniques to cope with stresses and strains. However, enlightenment is still far from complete and a significant number of young musicians, singers and dancers feel that airing of a problem automatically damns them in the eyes of their teachers to whom only the problem—insufficient talent and technique is recognisable. Clearly ISSTIP has a challenge to take up on behalf of many performers.

Finally, the editors wish to thank all those, both lecturers and audience who have made the seminars so enjoyable and informative.

SOME UNPOPULAR IDEAS ABOUT TENSION

by Christopher Bunting

As I stand, each of my feet experiences a force of at least 100 lbs. that is, perhaps, 2 or 3 pounds per square inch. Clearly this force diminishes as we proceed up the body. If I sit, then each buttock supports 100 lbs. minus the weight of one leg. Upon my surface I experience a force of 14 lbs. per square inch of atmospheric pressure and, if Newton is to be believed, I exert a corresponding pressure to counterbalance this. Inside me there are fluctuating pressures in every organ: blood pressure, air pressure in the lungs, fluid pressures throughout. Mentally, there is an alternation of hope and despair, fascination and disgust, reverence and irresponsibility, usually experiencing a continually changing admixture of all these. I experience the emotions and their physical concomitants. Most of the time, of course, the indefinable emotions that lie between the extremes.

As Heraclitus said—"All is flux". The river of Life flows on.

That all seems very satisfactory! A mild contentment with the experience of Life may rise to ecstatic wonder, gratefully, perhaps, to subside to a more tolerable everyday level, but if this were the whole truth there would be no music save that associated with the aeolian harp and its latter-day electronic offspring, a music of attenuated mooings and mewings. If this mild contentment were the whole truth there would surely be no need for a Society for the Study of Tension in Performance. That there exists such a society suggests that something is awry. If we could focus what it is that has gone wrong we might understand a little more of the problem.

We first should dispose of a fashionable myth, namely that we may obtain salvation and enlightenment via the imagined certitudes of science. Now the scientific method, that is to say the testing of hypotheses with replicable experiments, has yielded much valuable knowledge in the physical sector. In an age of doubt we cling to this kind of knowledge and make the cardinal mistake of thinking that it is the only truly valid knowledge.

It is embarrassing to read of the extraordinary philosophical uncertainties inherent in Physics since the twenties, and prefer to lodge ourselves in the bosom of Newton. With him there certainly was no backward flowing of time, indefinability, acausality, the impossibility of having an incontingent observer, all factors that present-day physicists must contend with.

Physics has a prestige all its own, and other sciences, especially those afflicted with inferiority complexes such as academic psychology, tend to ape its procedures in the hope of attracting a little reflected glory and respectability, but always with a time-lapse and an unintelligent over-simplification. Thus was born what was ambitiously called Psychology, though nowadays, because its devotees will have no truck with the Psyche, it tends to call itself Behavioural Science. It has been wittily dubbed the 'ratomorphic view of Mankind'. To extrapolate to Mankind results obtained by experiments with animals kept in conditions that would induce psychosis in humans seems to me to be an intellectual procedure of doubtful validity.

That apart, psychology, alienated from its subject, has inevitably a split character which further undermines the validity of its findings. I myself experience my life from within as do, I suspect, most of us, and if I

want a psychology at all, I want one that speaks intelligently and sensitively about that experience, that illuminates and enriches it.

In a television interview Dr. Jonathan Miller, himself the son of a distinguished psychiatrist, entertained Dr. Hanna Segal, the noted analyst and a friend, biographer and colleague of Dr. Melanie Klein who made a really outstanding contribution to the understanding of infant psychodynamics, and hence of *all* human psychodynamics, of the pushes and pulls that shape our lives. One may fairly say that artists and musicians that have no living link with their infantile psyche are not only stunted as adults but are also inevitably deprived of the very lifeblood of their profession. Dr. Miller's fine intellect, deriving from his intellectual background, is well-known and he conducted the interview elegantly but gave me that impression that he felt that his intellectual constructs were under threat. Thus it came as no surprise when he politely raised the question of validation. He was in short hankering after scientific proof.

And so do we come to the central paradox of our time. We distrust knowledge that does not issue from replicable experiments with careful controls, but this very method of inquiry implicitly and inevitably excludes much vital and valid knowledge. In psychology, especially, it is surely futile to exclude the very subject under scrutiny namely our mental experience!

Thus we must refer Dr. Miller to a fascinating exchange of letters between Dr. C. G. Jung and a distinguished English psychiatrist Dr. E. A. Bennet. In May 1960 Bennet reviewed Jung's book 'The Archetypes and the Collective Unconscious' for the British Medical Journal, and said, in the context of a generally favourable critique, that it was 'lacking scientific foundation'. On the 22nd of May Jung wrote to Bennet thus: 'A scientific hypothesis is never proved absolutely insofar as the possibility of an improvement always exists. The only proof is its *applicability*. What better proof for a hypothesis than its applicability?'

On 27th May Bennet replied: 'A scientific theory can be entirely satisfactory scientifically, and at the same time untrue absolutely, because a scientific theory is concerned with possibilities and with working hypotheses. But it is not concerned with absolute truth.'

On the 3rd of June 1960 Jung wrote to Bennet: 'The only proof of a theoretical viewpoint is its applicability and that it gives an adequate or satisfactory explanation, and has a heuristic value.'

The correspondence continued its elegant saraband . . .

On the 23rd of June Jung wrote: 'Psychical events are observable facts and can be dealt with in a scientific way.'

Perhaps I may here interpose the observation that a psychical fact may be expressed by a statement of manifest 'un-fact'. I'm thinking of the patient that Jung speaks of elsewhere in his writings who was convinced, or said he was convinced, that the Rhine flowed from the sea up to Basel. Jung pointed out that to treat this conviction on the basis that in fact the Rhine flows from Basel to the sea would be foolish. The contrary conviction was presumably related to a wish to reverse the flow of Time, a valuable piece of evidence for the person sincerely seeking to understand and help.

Getting back to Jung's letter . . . 'Nobody has ever shown me in how far my method has not been scientific. One was satisfied with shouting "un-scientific!" I observe, I classify, I establish relations and sequences between

the observed data, and I even show the possibility of prediction. 'The crux is the term 'scientific', which in the Anglo-Saxon realm means, as it seems, physical, chemical and mathematical evidence only. On the Continent, however, any kind of adequate, logical and systematic approach is called 'scientific': thus historical and comparative methods are scientific. History, mythology, anthropology, ethnology, are 'sciences' as are geology, zoology, botanics etc'.

On the 7th of July 1960 Dr. Bennet wrote to Jung thus: 'I agree with you that no one knows what 'absolute truth' means. You mention variation in the use of the word 'scientific'. I am inclined to think that in the Anglo-Saxon realm the word, as applied to method, is used very much as it is elsewhere. On the continent, and here as well, 'any adequate and systematic approach', to use your own words, is quite scientific. Your own approach one must certainly call scientific'.

Game, set and match to Jung!

Nowadays I think one could say that a study of semantics could have saved Dr. Bennet from his original fixity and Dr. Jung some postage.

If we consult Partridge on the words 'proof' and 'prove' we can get yet another dimension of insight. Latin—*probus*—upright, honest, good, going forward uprightly. Latin—*probare*—to find, or think good, to test, probable, probe.

Not a hint of 'the absolute' you will note. No whiff of Plato.

In all branches of knowledge we stumble forward empirically. In cooking—a little more pepper, less salt. In string playing—a little more tension here, less there. In love—tact and sensitivity—all guided by intuition. The great scientists all knew this and many avowed it publicly—Einstein, Eddington, Schrödinger. It has been truly said that nowadays there are many technologists but few scientists.

So who is a real psychologist? I would say that the people devoting their lives to analytic work amongst children and adults are building up empirically by on-going reality-testing, and cross checking, a body of knowledge in which we can discern constant themes that may guide us. If Science has painted itself into a corner in the way that I have described, then this body of knowledge must be content to be called a 'body of knowledge', but of course that defines Science in this field as futile.

Only a mediocre scientist could be blind to this, but this blindness is understandable in psychodynamic terms as symptomatic of a fear of knowledge that cannot be controlled and manipulated. This correlates with an early phase of infantile development, the so-called omnipotent-omniscient phase. In all humanity one must extend sympathy to these stunted people, once they have been removed from the positions of influence they currently enjoy in the educational field.

The emergence of a new being from unbeing has always fascinated the philosophers—the Greeks, the mediaeval churchmen, the self-styled 'enlightened' ones of the eighteenth century—an early example of public-relations 'hyping', not to say pure vanity! Today the correspondence columns of the Times are silted up with the fossils of those long-dead opinions. The conditions are new but the ideas, being psychodynamically determined, are as old as time.

The cosmic dance of atoms produces a prenatal being already responding to stimuli and exerting its own stimulation on the mother. It is busy experiencing its aquatic existence, swimming in the currents of physical and psychological pushes and pulls, of tensions, if you will.

In later, post-natal regressive states, this pre-natal phase is often hallucinated, under the impulsion of an overwhelming envy, as a totally blissful experience without boundaries or differentiation, and much music and, indeed, political affiliation and doctrine owe their dynamism to this fantasy. Recent work however suggests that the situation is more rugged. The developing being evolves in a world of physical pushes and pulls, chemical interactions and fascinating sounds.

The most familiar sound is the pulse of the mother's blood in the aorta. Is it merely a 'jeu d'esprit' if I suggest that in the regressive age in which we live, seeking ever more infantile satisfactions and reassurances, the remembered and longed-for aortal pulse is evoked by the mindless thud of pop music? Did you know that the french for that is *la pop music*, and nota bene, they don't say *la pop musique*. They evidently don't confound the two!

It is perhaps necessary for me to explain at this point that I am not using the term 'regressive' in entirely a pejorative sense. Human affairs are clearly at a watershed. We live in unprecedented times. As Michelet has said, 'Le temps a doublé son pas'. We react as does an individual, sensing he has unlifeworthy attitudes and a feeling of being cut off from roots, and we consequently regress to gain strength for the vital reformulation.

Before birth we are surrounded by all we need for our developing life, nourishment, temperature control, chemical homeostasis, sound and light filtering, gravity filtering by means of suspension in the amniotic fluid. Let it also be said that we are surrounded by the intelligence of Nature.

After birth, a traumatic episode of pushes, pulls and squeezes, all that privilege is lost and one is launched upon the post-natal psychodynamic sea. One encounters psychodynamically determined stubbornness as a fact of life—the bright lights and loud noises of the delivery room, the 'effecient' hospital matron who keeps baby from mother and vice versa at precisely the moment when bonding should be established so that the new human being may experience the vital beginning of an ontological trust that needs—nourishment, warmth, support and many chemical needs that we are only just beginning to understand—are met, and *met by the mother*.

It is also at this crucial period that communication is established, or not, as the case may be. If all goes well there develops an experienced validation of one's being and the true ego can begin to form. It is of the nature of the true ego that it is firmly incarnated, so firmly incarnated indeed that the very word 'incarnation' is seen to be tautologous and expressive merely of the cartesian schizoid split.

The infant's demands are, perforce, peremptory and inconvenient. From everything being 'on tap', so to speak, post-natal satisfaction and communication depend upon another being and conflict may arise. If nurture is adequate the infant may be weaned from the early all-or-nothingness and led to feel that its demands will, by and large, be met. It may be led to feel that communication has been established and that its needs, and, hence, its nature and character are adequately understood, that there is a place in the world, with its space and time boundaries, for the new human. A measure of

frustration begins to be tolerated and indeed, dare one say, enjoyed, in the way that any whiff of reality, *in a favourable context*, is experienced as strengthening and stimulating.

If the mother is healthy and able to understand her own psychodynamics however instinctually, she will enjoy the healthy aggression of the baby as proof of its viability, and her own self-worth-feeling will be enhanced.

If the mother has her own unresolved conflicts at the infantile level then these long-dormant complexes may be stimulated by the actual situation and tensions will develop. If the baby feels that there is a measure of rejection it will feel that this is potentially total and hence annihilating. The mother is not yet experienced or understood as a person by the baby, but is felt to be an entity of archetypal power. There will be anger at the frustration mediated by this being. The anger will be mixed with envy of the withheld bounty and blessing, and let us not forget that we are not considering adult envy but of the infantile variety which is, almost by definition, infinitely stronger.

The root of the word 'aggression' carries the meaning 'to step toward' and in the healthy situation this is met joyfully. In the unhealthy situation this aggression that seems to evoke the danger of annihilating retaliation must be re-routed, and it is then experienced as a self-attack, albeit felt to be, or interpreted as being, an attack by the mother.

Speaking personally I must say that music and art that draw their dynamism and *raison d'être* from the paranoid/schizoid position evoke in me revulsion, and I do not think that the public should be asked to pay for the privilege of acting as therapists. Au contraire!

Continuing our charting of the course of the healthy baby we see it navigating through the paranoid/schizoid narrows described by Melanie Klein, we see the beginnings of ego formation, of differentiation between 'I' and 'not I' and of what D. W. Winnicott has called 'object relationships'.

I have elsewhere* described the essential quality inherent in favourable action by the psyche-soma, tension in and upon Nature as 'differentiation of function'. No limb attempts to usurp the function of another, none attempts to overthrow the heirarchically-organized chain of command. The differentiated limbs are linked loosely, there is a flow of movement in time. The psyche is joyously incarnated.

It has recently struck me that there must be a close connection between this quality of action that I have called 'differentiation of function' and Winnicott's 'object relationships'. When I think of Casals' marvellous differentiation of function and also his extraordinary ability to relate in the real world of objects, his craftsmanlike way in music and 'cello-playing, I feel I must be on the right track. The careful crafting of a technique or of a fine performance, or of the memorization of a work, depend essentially upon the achievement of the object relationship phase. Without a clear chain of accurate kinaesthetic imagery both technique and memorization become impossible, and here, perhaps, we should recall William Primrose's dictum 'Technique is Memory'.

The artist that has achieved some measure of psychological maturity deploys his art in a continuum of tension. Every note is in tension with every other note. Every phrase is moving through increasing or decreasing tension.

*Essay on the Craft of 'Cello Playing. (Cambridge University Press).

the intervals, harmonies and rhythms all express and evoke dynamic tensions. The meaning is the tension is the meaning. The singer's air pressure carries the meaning. The string player has chosen an instrument which not only functions by means of strings in tension but which symbolizes that fact of life that is tension.

Those of you who have seen Bernard Levin's television interview with David Stern, will recall Stern's saying that there must be concentrated tension all the time.

We all like labels. Perhaps we can label this as 'Positive Dynamic Tension'.

But what of the would-be performer who, owing to insufficient or inappropriate nurture, is stuck at one of the more infantile stages of development? When writing this lecture, at this point I made a list of the ghastly things that associate with anachronistic developmental phases and realized that I had opened a Pandora's Box.

Here is the list: *Envy, Perfectionism, Philobatic and Ocnophilic Escapes, O differentiation, Identification with the 'All', Participation Mystique, Unigravity, Armaturing, Alienation from cybernetic verities, The seeking for repair of primary-narcissism-damage through public performance, The symbolic Equation, The discarnate psyche, Transcendence, trying and striving, Failure to relate to the instrument as an object.*

You will have to take my hand and allow me to lead you through the descending circles of the Underworld in the hope that we may emerge wiser, if sadder! We will take a look at each of these bleak factors and thus arrive at some kind of map of the territory where negative, self-defeating, tensions originate.

Firstly then: Envy. The infant feels it has nothing and the breast has all withheld richness. The tolerance span of the infant is very short as it has not yet built up a history of eventual satisfactions. The only way an instrumental technique can be built up is by patient testing and sequential hinking. Cardinal Newman's hymn is apropos: 'Keep Thou my feet: I do not ask to see the distant scene: one step, O Lord enough for me'. But, alas, we know that F. M. Alexander's 'end-gaining' is the rule rather than the exception. Years are wasted in fruitless effort, the primary aim of which is to achieve the end by force majeure—doomed to failure, of course. The secondary aim, that of evoking pity and moral approval, is usually achieved, but how pathetic that is.

In French Canada at an audition a young girl played a violin concerto rather unsuccessfully. She said: 'j'avais envie de jouer mieux'. Well, I know that's just a construction of the French language but, as I have indicated, I believe that etymology sometimes gives us a valuable link with the Unconscious. The girl was trying by will power to fill in that unbearable gap between what she could do and the image of what she thought was expected of her, and what she wanted.

Sometimes sibling rivalry accounts for a multiplying of the symptomatic tensions. Efforts are redoubled to regain the favour accorded to the more successful sibling. Perhaps all competition has an element of this factor.

Some of the inmates of my Chamber of Horrors are more closely related than others, and thus we may tackle 'Perfectionism', 'The Double-bind' and 'Alienation from Cybernetic Verities' together. The inadequately nurtured infant develops a compensatory fantasy of a boundary-less frustration-free universe where needs are met as soon as formulated. There is no Time tension. It is in this area that we may seek the origin of most of the philosophies that have bedevilled Mankind.

The name 'Cybernetics' was coined by Dr. Norbert Wiener shortly after the last war to denote the rapidly developing science of control systems. Many machines nowadays monitor and control their own functioning. One way—let me stress—one way—of describing human functioning is via an understanding of cybernetic systems.

Consider, for instance, the household thermostat controlling a central-heating system.

Mr. Smith, Mr. N. Riche and Mr. I. D. L. Plato would all like to maintain a temperature of 65° F in their houses. Mr. Smith buys a thermostat that switches the system on at 60° F and off at 70° F and is very happy with it. His house stays at more-or-less 65° F. Mr. N. Riche would like something a little more sophisticated, a little more 'accurate', a little more demonstrably expensive! He buys one that switches on at 64.99° F and off at 65.01° F. Unfortunately on stormy nights it emulates James Thurber's nervous card-table that switched capriciously into and out of its alternative mode as an ironing board—a case of mechanical identity crisis! Well, we are still, just, within the confines of sanity, but along comes Mr. I. D. L. Plato who will hear nothing of 'limits' or 'tolerances' and is thus forced by inexorable logic to construct for himself a system that switches itself on at 65° F and also off at the same temperature! On means off, do means don't, yes means no, play means don't play.

Bertrand Russell said: 'All science is dominated by the notion of approximation'—as well he might!

When last seen Mr. I. D. L. Plato was being carted off to a sanatorium in the shape of a perfect dodecahedron. Alas, it has no lavatory*.

Note the 'double-bind'—a term coined by Gregory Bateson. 'You must play perfectly, but that is impossible and meaningless, and yet you *must* play!'

Dr. Michael Balint distinguished two psychological mechanisms that enable the trapped mind to escape, so to speak, but at the cost of deserting integrity and meaning. He coined the term 'philobatism' to denote a flight into exaggerated motion or activity . . . swings and roundabouts, the Big Dipper, looping-the-loop etc. We've all heard frenzied practising that succeeds merely in reinforcing all the mistakes. Vapid virtuosity stems from this cause also.

Balint's other term 'ocnophilia' denotes a feature opposite, one could say, to the philobatic escape. Here we encounter a clutching, a paralysed unwillingness to let go deriving from unfulfilled experience at the breast. The Chinese unite the ideas of mental clutching—the unwillingness to let go of familiar tried-and-trusted patterns (remember de Bono's 'block of the adequate solution')—with actual physical clutching, in the expression 'Wu Li'. A third meaning of this expression is 'Martial Arts' and thus we home in on

*Quoted by permission of Cambridge University Press.

the idea of violence, violence done to the natural order, refusal to 'go with' nature.

This feature alone could account for most of the unwanted tensions we encounter in bad playing. May I here interpolate my own observation that we talk about 'grasping' an idea—apprehending it. Do we not so often act out our metaphors and clutch the instrument physically as we try to comprehend it? This observation will link us with Winnicott's Transitional Object that I will refer to shortly. I always find it fascinating to see connections between the work of psychologists working in different fields.

We come now to the failure to achieve differentiation of function, related to a failure to achieve object relationships. This relates to a very early phase characterized by fusionary wishes, identification with the 'All', the Heiros Gamos (the mystical marriage), participation mystique. We encounter here a wish for there to be no boundaries to excite paranoia. Indeed I might well be describing the bleak psychology of our country in the last four decades.

In all this do not let us forget a rather important object—ourselves! If we are unable to experience ourselves as objects made of beautifully interlinked and balanced leverages and components it is unlikely that we will be able to function harmoniously.

D. W. Winnicott, that universally respected paediatric analyst, proposed the concept of the transitional object, something that can stand intermediately between the infant and the mother, something that can be related-to emotionally without the overwhelming all-or-nothingness of the direct relationship. Originally it is usually a piece of blanket, later a teddy bear perhaps. Is it fanciful if I suggest that one source of instrument-clutching derives from a relationship that has not matured into the object phase but has remained to some extent transitional?

I notice in my work that a third motive for clutching comes from an attempted reification of what are really mental contents. After all, *where* is my 'cello technique? It exists in that mental meta-space where I can employ my imagination. Practising the instrument involves the constant up-dating and cross-checking with reality.

Related to this is the frequently-encountered confusion between musical tension with a muscular analogue. So many musicians cannot play 'con passione' because their mental intention connotes paralysis of the muscles. This, of course, links up with the 'double bind' that we have already described and a refusal of time-flow.

And so we come to Anti-gravity. It is noticeable that there is much propaganda in favour of 'up-ness' and against 'down-ness'. We talk of 'going up in the world', of 'uplifting' sermons (unlike this one!), of 'high-mindedness', of someone being 'head-and-shoulders' above someone else.

Per contra, we talk of being 'down-in-the-dumps' (or mouth), 'down-at-heels, a 'down-and-out', a 'low-down scoundrel'. 'So-and-so let me down'.

And yet anyone that has experienced any of the systems of functional re-education knows that without a submission to the fact of gravity there can be no functional differentiation of the limbs or permission for joints to act as joints.

It is futile for F. M. Alexander to get so up-tight, in his books, about people's perversity, for in taking a strong explicit stand against the reality of the psyche he may be accused of the very end-gaining he railed against so frequently and at such length. It may be however that in humanity one should excuse him because there is scant evidence that on this topic he knew what he was talking about. If people are strung up or knotted then it is for the very substantial reasons I am describing, and functional re-education in the absence of knowledge of the informing dynamics must be condemned as irresponsible.

Why would an infant have bad feelings about gravity? Before birth he is in rather the same position as trainee astronauts whose suspension in water gives them an approximation to the experience of weightlessness. Relating to gravity directly occurs at a time of convulsive change as previously described. If things don't go too well, gravity may be associated with trauma, something to be resisted. Perhaps the expulsion from 'paradise' suggests some existential guilt which one attempts to deny. Gravity and indeed corporeality would then be thought of as punishments.

Certainly an action universally popular with babies is to be 'taken-up', to be brought level with the mother's face so that the vital inter-communication 'I—Thou', may begin. If there is a failure here we see the origins of autism and damage to the primary narcissism, crippling to all, but especially, perhaps to a performing artist. Later we shall see that there is another dimension to this.

It is curious that we talk of an artist being 'taken-up' by a patron whereby the artist gains status. We also use the term 'taken-up' to mean blissful pre-occupation which again links with the essential mutual preoccupation and regard of infant and mother. If the artist is unable to feel safe enough to be preoccupied he will not be able to fashion his art.

I'm always fascinated by the reaction of string-players when I weigh their arms on a spring-balance and then hand them weights of the indicated value to hold in the hand of the arm I've weighed. The overt reaction is one of astonishment that the weight is so much. The covert reaction is really a rejection of the whole experience, and astonishment that a teacher of the divine art of music should be trafficking in gross matter.

Verily, most musicians have a touch of schizoid withdrawal about them and wish to inhabit a beautiful fantasy world. But it is possible to be incarnate and yet imaginative, and really, instrumental playing is so much easier if one has a body to do it with!

Notice in that sentence the cartesian split implicit in the language I'm forced to use!

Related to anti-gravity is 'armaturing'. The heavily defended person creates for himself a system of muscular tensions and refusal of joint freedom that enables him to have a delusionary strong self-image when the true ego is, by reason of inadequate nurture, weak. Men are perhaps the worse sufferers from this, especially as totally fixed massively muscular shoulders are considered 'manly'. If one can also develop a voice like a speak-your-weight machine one can achieve a persona that could fool anyone, including oneself, and make a handsome living doing 'voice-overs' for TV commercials advertising after-shave lotions.

Doubtless you have seen those priceless drawings of armoured American businessmen by Saul Steinberg. One feels that the shiny armour-plated steel suits they wear are all that is left of the personality. They have become their armour! Talleyrand said that in order to become great (*grande*) one must cease being 'grandiose'. Goethe said that in order to be great one must be great at something, and of course he was unwittingly touching upon the regression to the omnipotent/omniscient phase as lying behind the deformation.

Limp-wristedness is considered to be characteristically unmanly. Can this be a subtle saboteur of the flexible wrist essential for all instrumental performance?

I have had two paralysingly armoured pupils. One was a behavioural scientist and the other a doctor. Their propriocepts were so inaccurate that correct arm action, not to say harmonious differentiation of function in the cybernetic loop, was entirely ruled out. Both were intelligent men. Both were seemingly unaware of themselves as real objects in a real world.

Armoured women are usually of the so-called 'liberated' type who ape the manners of the immature male.

Another kind of armoring occurs in connection with injuries due to accidents or to operations. There appears to be a general body-cringe plus a specific limb-cringe associated with the location of the injury. There is also what might be called a life-cringe, an unwillingness to open oneself to the hurtful aspects of life. Again, the essential cybernetic loop is broken. With armoring of any kind one gets a sort of time-congealment, a focus on the past or the future, but, of course, effective action is only possible in the uncertain now. For the performing artist this time-congealment is at its most acute in the hours before the performance and accounts for a large proportion of that curse called concert-nerves.

Again I would say that dispersal of armoring without a dispersal of the deep psychological need for it must be condemned.

I have spoken of primary narcissism—the favourable self-regard the baby has. I was going to add—'as a birthright'—but this is clearly not so, for its development presupposes the mature and healthy mother, able to resist social pressures to deny her child its validation, its inauguration into a favourable cybernetic loop.

Is it not likely that some artists seek a repair of the damage to their primary narcissism by eliciting public approval when the private approval was withheld, and that this is the mainspring of their need to perform in public? You must have heard the story of the famous narcissism-damaged violinist who regaled a captive listener with tales of his world-wide fame, of outstanding concerts, of sensational laudatory press notices. At some point he must have felt that his grip on his listener was slipping and was prompted to say 'Enough of me! Tell me what *you've* been up to. Tell me when you last heard me play!'

If we take primary narcissism damage and injury together we sometimes encounter a compulsion to repeat a similar injury, evoking a repeat of the care and concern by others that is such balm to the soul! This can indeed become a life-style that is seductively sabotaging.

The term Symbolic Equation is used to denote a situation in which someone who has but a tenuous hold on reality can experience no difference

between an action and what it may be held to symbolize, for himself, or what he may imagine it symbolizes for others. No one has adequately defined what music is. The distinguished American composer and critic Roger Sessions has said that music embodies the gestures behind emotions. Certainly the gestures, imaginative or real, are entailed in the emotions. In case one is tempted to under-estimate the importance of the symbolic equation one has only to recall Jung's businessman patient at the top of his professional mountain, so to speak, who actually stepped off a real mountain into a very real abyss.

Nearer to our concerns we remember a young violinist possessing one of the great talents of this century whose schizophrenia featured the symbolic equation. This entailed his early death and a severe impoverishment in the musical world. Goethe said 'The desertion of reality never goes unpunished'.

I have been talking about Jung and also about schizophrenia. At least you will agree that the title of my lecture is honest! You may recall Jung's patient that was convinced that the sun could observe and judge his thoughts. Jung felt that the sun symbolized (or, perhaps, for the patient, *was*) his critical father, or, indeed, God. Am I being altogether too fanciful if I suggest that somewhere here lies my own enormously increased distress if I have to play under a strong spotlight? After all, the actual physical sensation, that of slightly increased facial warmth, almost amounts to a rather pleasant glow. Why is it then that one feels almost totally robbed of such talent as one may dispose? Why does one feel that one's very personality is under attack, and that only a strong effort of self-possession will enable one to perform adequately?

It is a cliché of espionage stories that the captive is interrogated under a strong light. Is this intuitively understood as eliciting the existential guilt and hence favourable for promoting confessions even from the innocent? One hears of the suspect being 'grilled' and made to 'sweat'. If one is sweating during a concert the physical effect suggests the emotional one, as William James pointed out, and so a vicious spiral is put into operation.

My list is nearly, you will rejoice to hear, exhausted.

The discarnate psyche has really been implicit in all the horrors I have been describing. Owing to inadequate nurture a manner of psychic functioning has force to be elaborated that is independent of physical contingencies, and so has come into being much of the philosophy and literature of our culture. When the psyche-soma is thus abused we must not pretend to be surprised when all manner of self-defeating tensions ensue.

Finally we consider transcendence, trying and striving, which are clearly related. We are talking about an extraordinary animal which eats and sleeps, and usually has most needs met. True, unlike most animals, it walks on only two feet, so the Devil is doubtless looking for occupation for its idle hands.

But what makes this animal go to a shop, hand over valued work-tokens, and come away with a heavy box containing another somewhat lighter box which resonates by reason of tensioned strings?

We have here the poignancy of the human condition, not content with being an animal in a state of nature, but certainly not too content with that extra psychic limb which itches! We must, it seems, transcend our mortality and link up with the spiritual continuum which has perdured for so long.

But gravity and mortality are psychologically linked and submission to both is essential for effective action in the here and now.

The origins of trying and striving lie doubtless in the early mother-child dramas. The baby feels that somehow he is failing to do the very thing that will elicit approval, not realizing that it may really be the mother's failure. Truly the omnipotent/omniscient phase is a two-edged sword. Later a parent or teacher may say 'now Johnny, you're not trying'. What is he to do? In order to placate the person who has power over him he must go in for some form of theatrical demonstration, knitted brows, tongue to one side, general tensing up. This feature alone is enough to account for so many bad performances. Have you ever seen a poster outside the Wigmore Hall announcing that someone will *try* to play the Hammerklavier Sonata?

Striving clearly relates to the poignant early situation with the as-yet impersonal mother. Etymologically 'strive' is related to 'strife'. Need more be said?

I have talked at length about the mind and the body and, I believe, I have shown you some of the perverse dynamisms that sabotage good functioning. I have said little about the spirit perhaps about the perverse way we have of splitting implied in the negative aspect of transcendence.

When we play great music we are, after all, moving in that spiritual world that we share with the great musical souls. What a privilege! Now I certainly don't want to engage in theological argument but do we not agree that whereas in the mind of God we are all born with souls, is it not one's experience that, as with mind and body, the soul takes a little while to mature? I feel that the most destructive tension at the deepest and subtlest levels arises from a terrific drive to play in a manner that one thinks is *de rigueur* or has been taught so, and yet which is totally alien to one's innermost being. One suppresses consciousness of this lie, but Truth, the truth of one's nature has the last word.

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SELF-ASSESSMENT OF ANXIETY IN DANCERS

Dr. Jean Whitehead

Abstract

This paper describes an exploratory study carried out with students at London College of Dance and Drama at the time of final dance examinations. The nature and purpose of 4 self-report inventories used in the study is first described and the advantages and disadvantages of the instruments is finally discussed.

Introduction

Spielberger's State-Trait Anxiety Inventory has been widely used. Construction work began on the test in 1964 and the test manual was published in California in 1970 by Spielberger, Gorsuch and Lushene. It is presented to subjects as a "Self-evaluation questionnaire" and consists of two forms each containing 20 self-referent items to which subjects must respond on a 4-point scale.

Spielberger's State Anxiety Inventory (SAI)

The first form assesses state anxiety (A-State) which is described as "a transitory emotional state or condition of the human organism that is characterised by subjective, consciously perceived feelings of tension and apprehension, and heightened autonomic nervous system activity" (Spielberger, Gorsuch and Lushene, 1970, p. 3). Because "A-States may vary in intensity and fluctuate over time" (Spielberger et al, 1970, p.3) this form asks subjects how they feel "right now".

Previous research has investigated how A-States vary before different physical activities. Simon and Martens (1979), for example, found that for North American boys A-State was significantly greater before performing a band solo than before competing in various sports or required school activities such as academic or physical education tests. Research has also investigated changes in A-State as a result of participation in physical activities. Whitehead (1981, 1982), for example, found a reduction in A-State following students' participation in university dance classes and other physical activities. However, if physical performance is poor, A-State may not fall after participation. Gruber and Beauchamp (1979) illustrate this in validating a short 10-item form of Spielberger's inventory known as the Competitive State Anxiety Inventory (CSAI).

Spielberger's Trait Anxiety Inventory (TAI)

The second form of Spielberger's inventory assesses trait anxiety. Spielberger et al (1970, p. 3) comment: "Trait anxiety (A-Trait) refers to relatively stable individual differences in anxiety proneness, that is, to differences between people in the tendency to respond to situations perceived

is threatening with elevations in A-State intensity". Because A-Trait is relatively stable over time, as a personality disposition, the second form of the inventory asks subjects how they *generally* feel.

Spielberger et al predict (1970, p. 3) that "those who are high in A-Trait will exhibit A-State elevations more frequently than low A-Trait individuals because they tend to react to a wider variety of situations as dangerous or threatening" and "high A-Trait persons are also more likely to respond with increased A-State intensity in situations that involve interpersonal relationships which pose some threat to self-esteem".

The second prediction can be tested by administering both forms of the State-Trait Anxiety Inventory to a group of individuals in a neutral, non-threatening situation and administering the State Anxiety form again in a threatening situation. The increase in A-State can then be compared for the "extreme groups" of subjects who were initially highest or lowest in A-Trait, and it would be expected that the high A-Trait group would show the greater increase in A-State.

If this result was universally found, the use of the A-Trait inventory could be a useful screening device for a teacher who wishes to identify in advance those performers who are most likely to show an increase in A-State at the time of performance. However, the predicted relationship is not always found. Klavora (1975), for example, found that both football players and basketball players showed a great increase in A-State from the practice situation to a pre-match situation, but the increase of the high and low A-Trait sub-groups was identical. The high A-Trait sub-group, however, was in each case consistently higher in A-State than was the low A-Trait sub-group, and this correlation between A-State and A-Trait measures has been found in some other studies with Spielberger's instruments.

If a teacher wishes to assess which pupils will show greatest increases in pre-performance A-State perhaps an inventory other than Spielberger's TAI is needed. A more situation-specific approach has already been taken in sport, where Martens' (1977) Sport Competition Anxiety Test has been developed to identify those athletes with the greatest predisposition to be anxious *before sports competition*. Although Spielberger usefully distinguished between state and trait anxiety he developed only unidimensional measures for each. What is needed for better predictions of A-State in specific situations is more situationally relevant measures of A-Trait. A person who is afraid of heights may not necessarily be afraid of spiders, cramped spaces or public performances.

Endler's S-R Inventory of General Trait Anxiousness (S-R GTA)

Endler and Okada (1975) developed a multidimensional measure of trait anxiety based on work of Endler, Hunt and Rosenstein (1962). Their inventory is more situation-specific and has scales relating to four types of situations: interpersonal, physical danger, ambiguous and innocuous. More recently (Flood and Endler, 1980) a scale for an anxiety in social evaluation situations was added. Using this instrument Flood and Endler tested the interaction model of anxiety and found a significant interaction between social evaluation trait anxiety and A-State before an athletic match, but no interaction between the interpersonal, ambiguous or physical danger scales of trait anxiety and pre-match A-State. Endler and Okada (1975) discuss how

the S-R GTA may be used to extend Spielberger's state-trait theory of anxiety and integrate it with the Endler and Hunt interaction model of anxiety. Thus it is appropriate to try out Endler's S-R GTA alongside Spielberger's TAI to see which inventory provides the better prediction in a given situation.

Thayer's Activation-Deactivation Adjective Check List (AD-ACL)

Recent work shows that not only is A-Trait multidimensional: so too is A-State. Thayer (1978, p 1) presents a psychological theory of multidimensional activation (arousal) rejecting the "traditional physiologically defined activation or arousal continuum" and suggesting two activation dimensions but a single continuum for energy expenditure. He writes (1978, p. 1) "One activation dimension ranges from subjectively defined feelings of energy and vigor to the opposite feelings of sleepiness and tiredness. Activation states associated with this dimension regularly vary in a circadian rhythm, and the dimension underlies gross physical activity and many aspects of cognition. The second dimension ranges from subjective tension to placidity and quietness, and it probably underlies a variety of emotions (e.g. anxiety) and stress reactions (e.g. effects of loud noise) . . ."

Thayer's theory develops from work with his AD-ACL which has four factors, acting often as bi-polar pairs. The test was initially developed as an adjunct to physiological measures to "eliminate apparatus problems and allow more flexibility in research" (Thayer, 1967, p. 664) but because of low inter-correlations between physiological measures it has gained even greater usefulness. Thayer notes (1978, p. 2) that "under certain conditions, self-report provides a better indication of general organismic functioning than does any single psychophysiological measure". This claim is made because a subject's phenomenological impression of anxiety can simultaneously integrate awareness of the responses of different body systems and may be clearly represented on self-report inventories to the extent that the subject is honest.

The exploratory study

After being informed of the general nature of the study, 45 students at the London College of Dance and Drama completed Spielberger's SAI, Thayer's AD-ACL, Spielberger's TAI and the social evaluation scale of Endler's S-R GTA in a classroom about a month before final examinations. The AD-ACL and SAI were completed in counter-balanced order. Students were then asked if they would agree to complete the AD-ACL and SAI immediately before and after final dance examinations or their final diploma performance. 26 of the group agreed to do this and 20 of these actually did so. The voluntary aspect of the study was necessary for ethical reasons so that students did not feel that the inventory-completion would adversely affect their performance, and also to obtain maximum cooperation and honesty from those who did complete the study. There were no significant differences in A-Trait scores between the participants and non-participants in the final phase of the study.

Changes in Spielberger's A-State measure (SAI)

Table 1 shows group mean scores for the three conditions (neutral, pre-performance, post-performance) for the group as a whole and for the different "extreme sub-groups" formed on the basis of each of the A-Trait measures. A one-way ANOVA for the whole group was significant at the .01 level and further analyses by t-test showed a significant rise in A-State from neutral to pre-performance conditions and a significant fall from pre-performance to post-performance. In the light of the significant changes for the group as a whole, the sub-groups were formed by rank-ordering subjects on Spielberger's TAI and taking the upper 7 as the high A-Trait group and the lowest 7 as the low A-Trait group, disregarding the middle 6 subjects. This was repeated for Endler's S-R GTA social evaluation "A-Trait". Results for the sub-groups are illustrated in figures 1 and 2.

Table 1. Group mean scores and standard deviations for A-State scores in 3 conditions

Group	Neutral		Pre-performance		Post-performance	
	Mean	SD	Mean	SD	Mean	SD
ALL	42.3	(10.4)	53.4	(12.2)	45.0	(11.8)
High TAI	45.6	(6.9)	54.3	(13.5)	50.6	(10.2)
Low TAI	32.1	(5.5)	50.3	(15.3)	38.0	(14.8)
High S-R GTA	40.9	(11.2)	56.6	(12.0)	45.7	(15.8)
Low S-R GTA	38.1	(8.5)	47.3	(14.6)	43.6	(12.8)

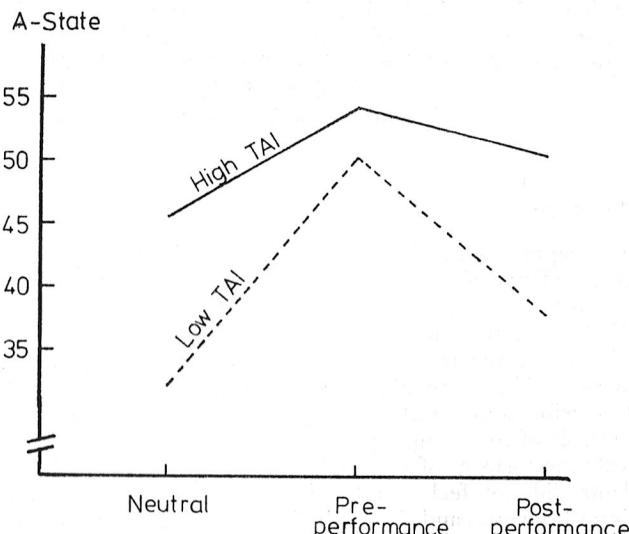


Figure 1. A-State scores of extreme sub-groups on Spielberger's A-Trait in 3 conditions

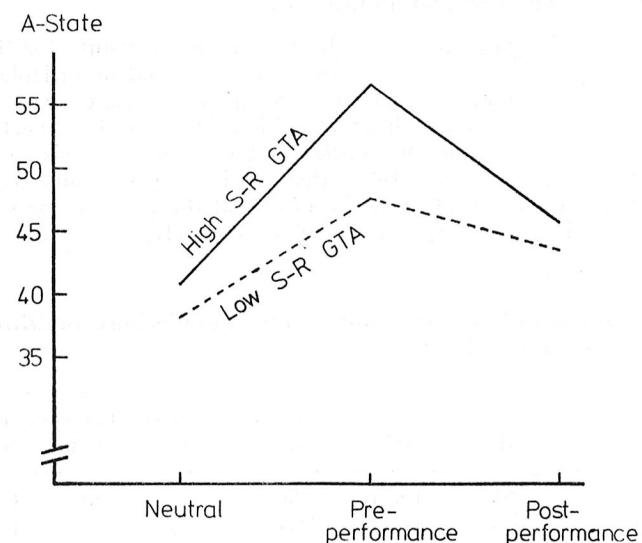


Figure 2. A-State scores of extreme sub-groups on Endler's social evaluation A-Trait in 3 conditions

It will be noted that the pattern shown by the extreme groups on the TAI does not fit Spielberger's prediction. The high A-Trait group does not show the greater increase in A-State. Moreover there is a correlation between A-State and A-Trait ($r=0.63$) such that the high A-Trait group is initially much higher in A-State. Results obtained with Endler's S-R GTA however do fit the original prediction for Spielberger's test. The high A-Trait group does make the greater gain in A-State and there is little initial difference between the groups because the correlation between social evaluation A-Trait and Spielberger's A-State is low (0.22). Results from this small sample would therefore indicate that if a teacher wishes to identify, from a group not showing initial differences in A-State, those who might do so in performance conditions, then Endler's social evaluation scale might be the better inventory to use. It is also worth noting that Endler's social evaluation scale had a higher correlation with A-State in the pre-performance condition (0.35) than in the neutral (0.22) or post-performance (0.09) conditions, whereas Spielberger's A-Trait scale showed the reverse pattern with significant correlations with A-State in the neutral (0.63) and post-performance (0.57) condition but a strikingly lower insignificant correlation of 0.25 in the pre-performance condition.

Changes in Thayer's activation measures

Table 2 and figures 3 and 4 show comparable results for Thayer's Dimension B (tension) when this is taken as the dependent variable instead of A-State. It is noteworthy that although highly correlated with A-State (0.85) the pattern of scores is different. This is in part to be expected from small samples and different inventories, but it gives emphasis to a point made elsewhere (Whitehead, 1983) that an investigator must know the characteristics of the inventory he is using and the purpose for which he selects it if he wishes to interpret the results adequately.

Table 2. Group mean scores and standard deviations for Dimension B (Tension) in 3 conditions

Group	Neutral		Pre-performance		Post-performance	
	Mean	SD	Mean	SD	Mean	SD
ALL	20.0	(5.9)	29.6	(7.7)	23.0	(6.3)
High TAI	19.9	(7.3)	31.1	(8.5)	28.9	(6.0)
Low TAI	18.0	(4.2)	29.1	(9.8)	19.0	(4.4)
High S-R GTA	20.6	(6.5)	32.6	(7.9)	26.0	(6.7)
Low S-R GTA	16.7	(3.5)	25.1	(7.5)	20.4	(6.6)

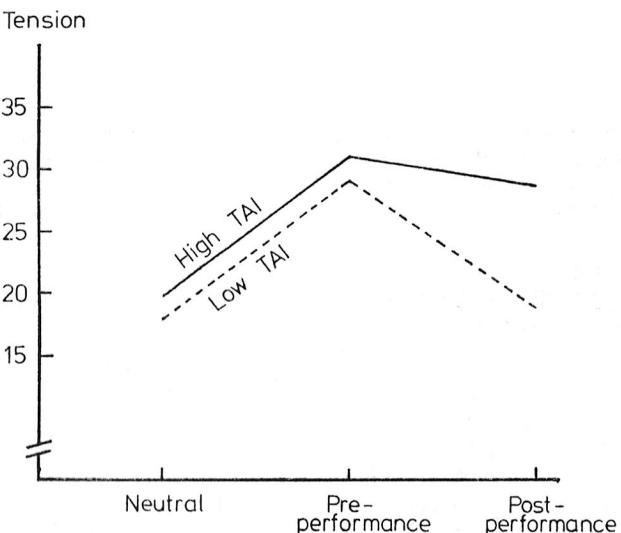


Figure 3. Tension scores of extreme sub-groups on Spielberger's A-Trait in 3 conditons

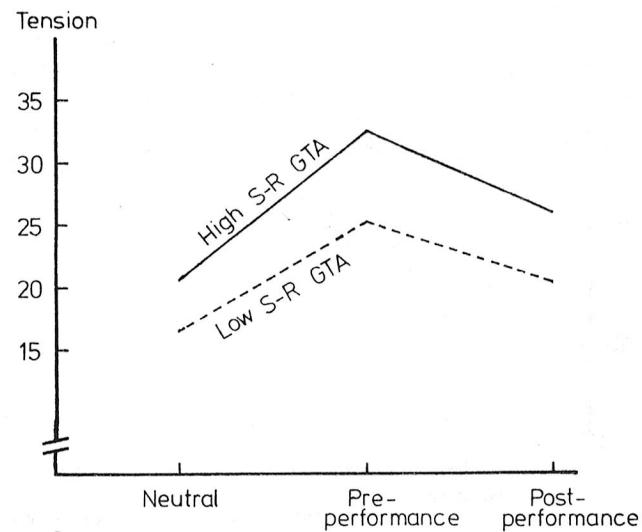


Figure 4. Tension scores of extreme sub-groups on Endler's social evaluation A-Trait in 3 conditions

Table 3 and figures 5 and 6 show comparable results for Thayer's Dimension A (vigour). It is noteworthy here that it is the *low* A-Trait subjects who show the greatest elevation in activation in the performance situation, and that Endler's S-R GTA shows the clearer interaction. The correlation between Thayer's two measures is negligible (-0.06) in this situation, which is why both measures are needed to provide a complete picture of what is happening. Studies investigating whether the relationship between arousal and performance is linear or curvilinear have tended to use A-State as a measure of arousal. Results obtained with Thayer's AD-ACL show that to neglect the second dimension of activation is to miss half the story.

Table 3. Group mean scores and standard deviations for Dimension A (Vigour) in 3 conditions

Group	Neutral		Pre-performance		Post-performance	
	Mean	SD	Mean	SD	Mean	SD
ALL	22.8	(8.8)	31.9	(8.0)	25.8	(3.9)
High TAI	19.9	(11.2)	27.4	(11.2)	25.6	(10.7)
Low TAI	29.4	(5.1)	35.1	(2.1)	28.0	(7.4)
High S-R GTA	26.6	(11.3)	28.7	(11.9)	26.9	(10.6)
Low S-R GTA	23.9	(9.6)	35.6	(2.4)	29.1	(8.9)

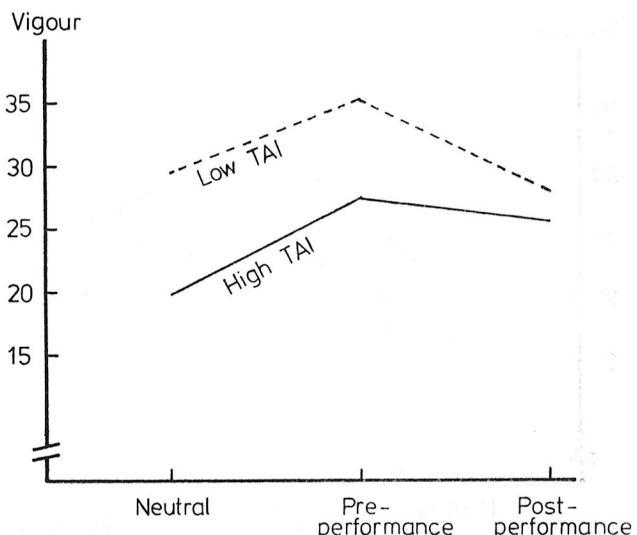


Figure 5. Vigour scores of extreme sub-groups on Spielberger's A-Trait in 3 conditions

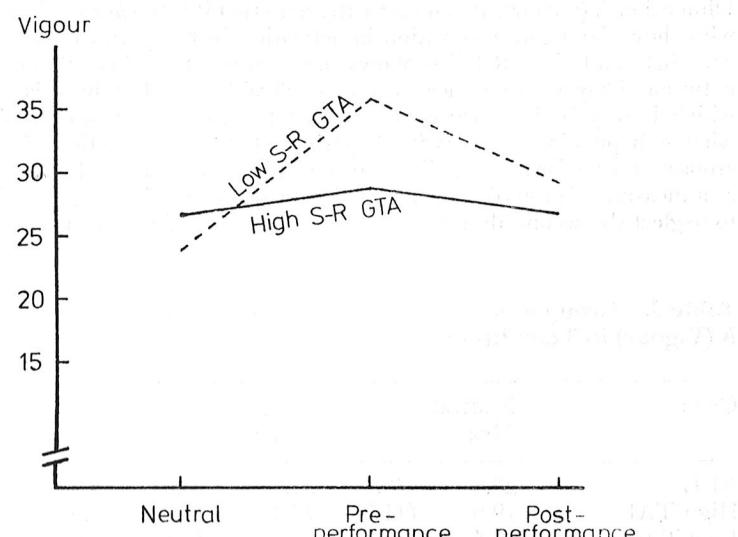


Figure 6. Vigour scores of extreme sub-groups on Endler's social evaluation A-Trait in 3 conditions

Discussion

The study described here was a small exploratory one in a series of ongoing studies (Whithead, 1981, 1982, 1983) comparing results obtained with different self-report inventories. It is incomplete without objective measure of performance and an analysis of relationships between anxiety and performance. At the time of writing the dancer's examination results are not known and, if they were, the sample size is too small for conclusive results. The time at which the inventories were completed also varied somewhat between subjects, generally being 20 minutes before performance.

There is a common view, supported by research evidence, that many performers have an individual optimum level of A-State for maximum performance, so it is not intended to suggest here that a rise in A-State is necessarily undesirable. It seems more important that a performer should learn to become aware of situations in which A-State has risen *beyond* this optimum and should learn to control it and bring it down by relaxation or other techniques.

The purpose of this paper is rather to suggest cautions in the use of self-report inventories. They do have advantages in that they are inexpensive compared with physiological equipment, they can be administered quickly and given to a whole group simultaneously and they can provide useful information about current states of anxiety or activation as well as identifying people most likely to become anxious in specific situations.

However, they can be easily "faked" (Morgan, 1978) if cooperation with the subject is not good; training is needed to administer the tests and interpret the norms and scores; great care is needed in selecting or adapting an appropriate inventory for a specific situation; ethical considerations limit their use in pre-performance situations if they may be disruptive to a performer's concentration; and they do assess only the psychological level of response. Physiological and behavioural indices are also needed for a complete picture.

This is not to say that their use should be abandoned. If an inventory can be identified that does what is needed for its user then it can provide quick relevant information. The advice is not to fear to take a forward step but to do so with caution and with eyes open.

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KEYBOARD SEMINAR

Conducted by Carola Grindea

at Second International Conference for the Study of Tension in Performance

The sensational publicity in the American press and through the media to the physical injuries experienced by a great number of instrumentalists—the majority pianists—(ISSTIP JOURNAL vol 1 No 1 "Physician's views of Physical Problems" Robert Silverman Interview with doctors Fred H. Hochberg and Robert Leffert, p 23) prompted ISSTIP to organise a 'Keyboard Seminar' at the Second International Conference (July 1983). This seminar was intended to cover a wide range of aspects of the many problems encountered by pianists, teachers and students during the years of training and during performances.

The response was very interesting indeed. The majority of speakers came from America where pianists and teachers had first hand information about the recent developments in the field of 'Music Medicine'—a branch of medicine which is gaining more and more recognition along with the 'Sports Medicine'. ISSTIP regrets that the papers and demonstrations offered at the Conference cannot be published in full but it is including resumes of all these valuable contributions.

The speakers taking part in the Seminar approached the problems from several angles: physical, physiological and psychological. It was felt that there is a great need for teachers and performers to re-assess their own approach to piano playing and teaching as the only solution to prevent such crippling injuries in future. There was also a need for a re-assessment of the attitude to performance, and great care about conditions under which pianists are expected to function since these are conducive to great stress, which, in turn may result in physical or psychological traumas. There were those who emphasised the importance of training pianists and teachers with more understanding of the role of the body in performance and of a technique based on natural and well coordinated movements.

Blanche Abram, professor at Hofstra University, New York, in her talk on MUSCULAR EASE AND MUSICAL TENSION IN PIANO PLAYING—discussed the importance of developing a 'natural' piano technique which allows the pianist to play with ease. She believes in 'the use of devices and exercises that build awareness of different points of tension and their release at will, awareness of sensations involving fingertip support of the weight of the arm, attention to the relation between the natural shape of the hand and the geography of the keyboard. Of great importance is the use of the co-ordinated gesture that helps develop both physical and musical continuity, so necessary for the projection of musical tension'.

Phyllis Lehrer—Chairman Piano Dept. Westminster Choir College, Princeton, New Jersey—talked about PREPARATION FOR PERFORMANCE. She approached the subject from both the physical and psychological angles. She gave simple but very sound suggestions on how to cope with the anxiety inherent in a performance and how to avoid memory failures. She emphasised the value of a close co-operation between teacher and student in

preparation for performance, and recommended performance rehearsals different intervals as only a thorough preparation will give the student the confidence that he will succeed.

Minuetta Kessler, in her paper BODY POWER TECHNIQUE stressed the need for a responsible attitude on the part of those involved in the piano profession to explore and re-assess their techniques of teaching and playing. She particularly asked composers to review their attitude and write music which should serve the performers and not over-tax their capabilities or 'precious muscles and tendons'. She, herself, had been the victim of the carpal-tunnel syndrome and, fortunately she had a successful operation on both wrists. This does not mean that an operation can be recommended in other cases since each hand presents its own specific problems. Most responsible surgeons are reluctant to perform such an operation on pianists or other instrumentalists because of the risks involved.

Samuel and Ethel Lehrer, piano teachers in the New York area, presented a joint paper BEYOND ORTMANN AND SCHULTZ—a study of the physiological conditions in piano playing. The two important theoreticians who have written extensively on these vital aspects of piano technique are: Otto Ortmann—'Physiological Mechanics of Piano Technique' (Kegan Paul, N.Y. Dutton 1925) and Arnold Schultz—'The Riddle of the Pianist's Finger' (Carl Fisher Inc. 1936) and they have come to revealing conclusions, reinforced by scientific experiments. Both authors point out that 'Muscle-contraction-Relaxation-Fixation' in piano playing take precedence over Weight-Relaxation. While scoring effective points against the exaggerated aims of the 'relaxationists' they were themselves led to exaggerations which often obscured the fundamental merit of their theories. No doubt, the idea of relaxation has been somewhat discredited due to the influence of Ortmann and Schultz on piano thought in the second half of this century. The Lehrers propose a reconciliation between the two points of view which is both possible and desirable. The term 'fixation' or 'relaxation' could be interpreted in a broader sense: 'relaxation' to be accepted as a relative condition limited by the need to contract muscles in order to create movement, and the Ortmann-Schultz concept of 'fixation' or when 'immobilizing' a joint to be considered as 'stabilizing of joints'—as understood by kinesiologists. It is the confusion between 'fixation' and 'stiffening' that lead Ortmann and Schultz to attribute fatigue to excessive use of muscles rather than to incorrect co-ordination of muscles. To support their views the Lehrers presented their own experiment with a computer on the possible combination of movements of the twenty-two muscles of the hand. (from the wrist to the tip of the fingers). The computer came out with the staggering figure of 2,432,902,000,000,000 and the Lehrers conclude that only through 'differential relaxation' can the pianist's muscular co-ordination function freely—a process which allows minimal muscle activity while isolating and eliminating any superfluous action.

They continued their demonstration with exercises aimed at introducing the players to an awareness of the freedom of their arms, and of the tension in some parts of the playing apparatus while the rest of the arm was completely free.

The Psychology of piano playing was the subject of several communications.

Juliette de Marcellus, piano teacher in Florida and author of several articles, read a paper NEW LIGHTS ON STATES OF MIND DURING PERFORMANCE based on a study by Arnold Schultz, 'Theory of Consciousness', (East-West Philosophical Library, New York, 1966) in which he discusses the psychological and physiological conditions in piano playing.

Dr. Anne Henley, professor at St. Catherine College, Minnesota, on CREATIVE VISUALISATION—Antidote to Performing Anxiety, a 'technique of using your imagination to create what you want in life' (Shakti Gawain, 'Creative Visualisation' 1982). She considers it a kind of self-hypnosis used as a therapy to instill a positive self-image in the subconscious. She stresses that this can be realized by using relaxation techniques and mental imagery to develop a positive self-concept. This technique is possible only if the body is in a state of deep relaxation. Research on brain wave pattern have revealed that the brain operates at alpha level when the body is in that state. 'At this moment you are able to make more effective changes in your life through creative visualisation than you can make by thinking, worrying and planning'—wrote Shakti Gawain.

To illustrate her point, Dr. Henley suggested that the pianist, in a state of deep relaxation, should 'visualize' a walk through beautiful country, full of flowers, sunshine, creating his own safe place in the imagination, a sort of sanctuary where he feels happy and at ease. In this sanctuary he meets a guide, perhaps a greatly admired pianist who would become the support and who would encourage, inspire and stimulate the player to give his best performance. In 'creative visualisation', 'you achieve a state of hypnotic trance, concentrating on what you are imagining, yet remaining conscious of what is going on around you'. Dr. Henley adds that this is not an unusual experience, comparing it to daydreaming, or being absorbed in a book or fascinated by a flickering flame.

The essence of creative visualisation—according to Michael Kelly, a hypnotherapist at St. Paul University, Minnesota, is that you imagine yourself as you wish to be, having already attained your goals. In other words, you work towards developing a new image. Your self-image is the key to your personality and your behaviour. By expanding your self-image you expand your possibilities. The development of an adequate, realistic self-image may endow a person with new capabilities and talents. Ancient yoga philosophy aptly expresses the importance of self-identity: 'You become what you think'.

In order to use creative visualisation most effectively it is necessary to set realistic goals and work towards accomplishing them. Whatever the goals, it is also important to 'visualise' often, returning to your 'personal sanctuary' for a while every day. It is recommended to continue the visualisation for a minimum of *twenty-one days*, since it usually takes at least that long to effect any perceptible change in the self-image. Dr. Henley does not consider creative visualisation as a cure for everyone suffering from severe anxiety but offers a method reaching the subconscious and implanting positive thoughts and attitudes that may produce some good results.

Eloise Ristad, author of 'A Soprano on Her Head' (Real People Press 1982) gave a short demonstration on her humorous yet serious approach to treating anxiety in performance. This is a kind of 'GESTALT THERAPY':

she allows her 'guinea-pigs' to act their inhibitions while playing their programmes, poking fun at the 'judges' who criticise the performance, at the same time getting the pianists to become more aware of the greatness of the music, of the sensation of smoothness or elasticity of the keys, of the enjoyment of the actual physical sensation when able to perform freely.

An interesting paper was read by **Greta Motts**, a post graduate student at the Guildhall School of Music and Drama, London, on 'Is Biofeedback valid for Piano Performance?' and 'The Advantages and Disadvantages of Myographic Measurement in Piano Playing' after participating in several experiments with pianists in master class situation, assessing their muscular and mental tension with biofeedback apparatus.

The discussions which surrounded these presentations were most illuminating particularly those which followed a demonstration on the **ALEXANDER TECHNIQUE** by **Linda Babbitts** and **Hilary Mayer**, two therapists from USA. They tried to put across the value of the Alexander technique for performers, learning to become aware of the use of self as indivisible whole. The pianist should not direct his attention to one or more separate parts of he playing apparatus but consider these in the context of himself as a 'whole'. They also emphasised the role of the technique in the release of accumulated, unnecessary tensions, bringing about an effortlessness and lightness in the use of one's self.

Some of the scientists present, particularly the physicians, doubted the scientific value of such a technique, but many others expressed their view on the importance of Alexander Technique for everyone, not only for performers. It was also thought that such seminars should be held more often.

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It is with deep sorrow that we announce the untimely death of Eloise Ristad, one of the most appreciated and loved colleagues, who has done invaluable work helping so many to learn how to deal with stress.

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A PSYCHOTHERAPIST'S PERSPECTIVE OF THE PERFORMER

Helen Gavzer

We all know that stagefright has been with us long before ISSTIP has begun its studies. I am sure that the Greek Chorus had their problems and so did many performers along the centuries. Sarah Bernhardt called it, in her native French, *le trac*, and it was to plague the actress throughout her long career. Recently Sir Laurence Olivier wrote in his autobiography in depth about his stagefright experiences and he talked freely about this in an interview on the American television "Sixty Minutes" programme.

The knowledge that such great actors have been afflicted with stagefright does give some of our younger performers much encouragement, but for some it is a cause for anxiety and soul searching. On a good day they will think: "If it can happen to these great artists of course it will happen to me and I'll overcome it just as they do". But, on a bad day? They will tell you it can only be endured by such giants. They think: "With my little talent and experience what hope do I have?" They confess it is an awful feeling.

In my work with performers I have noticed that most of the usual problems seem to become exaggerated. Here are people who are the most likely to suffer from lack of self-esteem and the effects of self-deprecation, yet these are the most likely to choose the acting profession. Jane Howell, the British Director of Shakespeare plays, believes that we choose our profession because of our weaknesses and not because of our strength and she considers that theatre is therapy. She herself had been a frightened little child at school. When a sensitive teacher gave her the opportunity to direct a school play, she found a place where she could feel very comfortable. She never looked back.

Everybody's experiences of course are different but I found enough similarities to see patterns emerging. I continued to treat my patients with an eclectic approach—namely anything that would work—in addition to my own process, but it was frustrating to find at that time that so little research had been done on the subject. I became more and more fascinated with this study and I decided to interview some of the great artists. I wanted to know what they would say on the subjects and especially, how they 'keep going'.

Most performers would talk freely, but some actually admitted that they would find it easier to talk about very personal matters, such as their sex life rather than about their feelings of fear on the stage. I have corresponded among others with **Laurence Olivier** and **Ralph Richardson**, and it has been very rewarding.

Laurence Olivier is considered the world's greatest living actor. He has had three serious illnesses in his life, one was cancer, the second was thrombosis, but he suffered another disease which was not made public knowledge until recently. After forty-five years in the theatre, when he was about sixty,

Laurence Olivier got stagefright. When he was asked how bad it was he said: "I felt a complete breathlessness. Constriction in the throat and the mouth and the tongue, and just the whole world closing in on me, and it spread to my horror, when I was playing 'Othello' and I started giving a hooded performance—not wanting to face the audience, trying if possible to turn my back on them, to turn my face away from them—saying to that wonderful actor Frank Finley, my Iago: 'Don't leave the stage, please don't leave me, or I'll run'."

Olivier's agonies of stagefright were left unnoticed by the critics, who found his performance stunning. When Lord Olivier was asked about himself, his acting, and if he had any recommendations for young actors. He said: "acting is a game of make believe, and I find the essence of it is *pretending* I'm going to be a fellow named Hamlet, or *pretending* I'm a fellow called King Lear. With Lear, it's regrettably easy for me, because now in my crusty old age, I'm exactly like him, although I haven't the majesty, of course. I have every other characteristic of Lear—unreasonable, impossible, stupid, stubborn, and I'm sorry, that's me. At the time I did Hamlet, I was much more like Hamlet, and I had all those qualities, and particularly all the weaknesses. And I think if you can recognize that—here is a little secret for the actor: "Use your weaknesses, aspire to the strength".

I was able to interview **Sir John Mills** in between acts of "Goodbye Mr. Chips" at Chichester. Of stagefright he said: "I had to work it out for myself as to what it was, what stagefright is all about. I decided it wasn't bad notices that worried me, it wasn't eggs being thrown at me, because I've had both eggs and tomatoes thrown at me. It wasn't that. It wasn't falling over on the stage. It wasn't anything to do with that at all. *It was the fear of drying up.* That's the only thing that I've discovered about stagefright. Once I'd got that idea firmly in my head I managed to get over it. I decided that I could walk off the stage and look at the script and come back, and if you can get this attitude of mind, that will surely help. If you'll ask most actors, they'll say the same thing: 'drying up'. Once I was acting in a play and I had a long speech of three pages; I dried up in the middle, stone dead; there were six other actors on the stage, we'd been playing for about seven months. They were involved in their speeches—they looked at me and I looked at them. I looked off to the prompt corner and there was nobody there. I then walked off the stage, found the page, got the line, walked back, and got on with it. I had three friends in front, and they didn't even know what had happened—so that's what I think stagefright is all about . . . its the fear of drying up".

I asked Sir John Mills if he had any coping techniques. "No, he said, he didn't. And there is nothing that can be done". He believes everyone has 'nerves', and he thinks that if you don't feel nervous, you shouldn't go on, because then the performances are dull, and can become very flat. "First nights, even though they may not be the best performances, can be the most exciting because, like horses, actors are sweating and keyed up for it".

Jonathan Miller, performer, director as well as psychiatrist, defined stagefright as acute anxiety attacks in the context of a theatrical performance,

and considers it a critical exposure of yourself in a dramatic form. He had known of many people who have nightmares about being on the stage, having forgotten lines and having nothing to say while a silent, watchful audience is waiting for you to say the next thing.

"What happens is you stand outside of yourself and you get a duplication of yourself and you see yourself performing and then you get this terrible thought: 'If I can see myself performing, then I'm not actually performing—then who is performing?' and everything starts to break down. Then what you get are pauses that seem to subjectively last forever; at which time you get in a kind of sweaty, anxious state and you fantasize about the attitude and action of the audience watching you, and you wait for the next word to come out. Objectively, of course the audience is not aware".

When I interviewed **Denis Norden**, wellknown TV and radio personality, he talked about his experiences of stagefright. But since he had worked with many famous performers through the years, I asked him if he had any stories of note related to stagefright. He told me about Peter Sellars, who, in his early years of radio and TV shows, suffered so terribly with stagefright that a friend suggested that he should see a medical hypnotist. Incidentally, every performance was really marvellous, Peter was always a wonderful comedian no matter that he was feeling this enormous fear. So, one day after he had done a number of television recordings in an absolute state of terror, he went to see this doctor, and he put Peter 'under'. Unfortunately, Peter 'came to' a little earlier than he was supposed to, and he heard the doctor say: "Now in a moment I'm going to snap my fingers and you will waken and feel refreshed, and you will not feel nervous and you will do your performance tonight without any anxiety. And as you leave my office, you will see my secretary, and you will say to her 'how much do I owe you'? This doctor evidently dealt with actors before, and was taking no chances of not being paid. When Peter returned to the theatre where we were doing this show, he was still laughing so much, that he did not feel nervous at all. Now we don't know whether it was the hypnosis, or whether this incident put his nerves out of his mind".

I met **Derek Jacobi** on the lawn of the Royal Shakespeare Theatre at Stratford and I asked him if his experience of becoming a world-renowned actor since his performance in 'I, Claudius' had given him more responsibility. "Yes, of course"—he said. "It is this new responsibility which terrifies me, whereas before I should have enjoyed it. Even though I know the part well and I know what I am doing and I believe the audiences enjoy my performances, it has become more burdensome now just because of the audiences' expectations. I have been trying with all my power to fulfill their expectations, but I became so anxious that I thought I was going mad. I thought that I would never be able to go on the stage again. I would suddenly come out into a cold sweat, for no reason at all, at any time or place . . . it had its birth in my fear of performance. I went to see a psychiatrist who diagnosed 'anxiety depression' but I don't think the doctor helped me much. He put it down to the fact that my mother died recently, but this had all happened before my mother's death. So, I decided to help myself. I knew that I had to work

gain and unless I would make myself go back on the stage and take part in the Royal Shakespeare Company's plays I would lose that particular kind of nerve it takes to get on the stage". Derek Jacobi then talked about his search, his experiences, his studies of different disciplines like relaxation, Alexander technique, but it was his determination to get on with the job which surely must have been at the source of his conquering the anxiety. When asked whether he had known anyone who had given up the stage altogether because of stagefright, he replied: "Yes, I've known quite a few . . . that feeling of electricity is just too much for some people . . . it becomes a jolt that does not energise you but can be a killer like the electric chair".

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STRESS AND MUSICIANS

Ans Samama

Many people hold the view that "stress", a common phenomenon among performing artists, is exclusively caused by psychological tension. It is far less known that stress symptoms can have physical causes as well. It is with the latter causes of stress that this article is mainly concerned.

Unfortunately, stress and stage fright are concepts that, like the concept of love, mean different things to different people. They are discussed so vaguely that it is often difficult to grasp what is exactly meant. Even experts often do not clearly define the concept of stress. In general, stress could be compared to the following mechanical phenomenon: a wooden board is fixed at both ends and in the middle of the board stones are piled up. Pressure is exerted on the board. The more stones are piled up, the greater the pressure, until finally the board bends in the middle: stress. If we keep adding stones, the pressure on the wood fibres will eventually be too much and the board will break in two: stress kills the artist. Of course it is too simplistic to compare biological stress to the pressure of stones on a wooden board; nor does the comparison yield any insight into the *causes* of the pressure or the tension that the artist is exposed to.

The first person who conducted scientific research into biological stress about 45 years ago, was Hans Selye. He and his associates exposed test animals to a number of unpleasant stimuli, excessive heat, cold, pressure, pain, loud noise, light, movement, immobility, hunger, thirst and others. The immediate result was that the test animals showed an increased activity in all their organs, in order to resist the unpleasant stimuli. However, when exposed to the stimuli continued, organ activity decreased again and in the end the animals died of exhaustion. Autopsy revealed widely spread damage to the body, caused by the increased activity of the organs. All the *different* stimuli brought about the *same* sort of damage. Selye called the physiological response of the organs to the unpleasant stimuli "stress" and the stimuli themselves he called "stressors". We shall follow Selye in this and define stress as the "non-specific answer of the body to every kind of external pressure". In human beings, organs and systems also react with different activity to such influences as in Selye's experiment and physical, psychological, or psycho-somatic symptoms are the consequences. Sometimes a stressor may have a positive stimulating effect, as is the case with a word of appreciation, applause from the audience, frequent invitations to do something (make music, give lectures, and so on). Every person likes to be appreciated. When positive stress is created, every function is at its optimum. If the stressor becomes aggressive on the other hand, when for example the artist becomes less and less successful or overschedules himself, the stressor will have a negative effect. Such negative stressors can also exist inside oneself. They may be of a psychological nature, in the case of unrequited love, or feelings of guilt, but also of a physical nature, for instance when muscles are incorrectly used. Everything just depends on the individual's reaction—good or bad—to any stressor. The reaction may be fiercely positive as well as fiercely negative. Sometimes the body hardly reacts to the stressor at all, in which case stress

either positive or negative reaction is correspondingly less. Also muscle sions can be the cause of stress. In terms of art, artists—and performing its especially—live under stress. The point is whether stress can be bed with or whether it hinders the artist in his performance.

I would now like to take a closer look at the physical cause of stress with negative effects: many musicians have to cancel concerts because of physical complaints, such as inflammation of the nerves, tendinitis, muscle injuries, back complaints and so on and so forth. Julian Bream, the famous guitarist, once said in an interview on television that he had suffered so much pain in arms and hands that he had considered giving up his career. He is not the only one. Leon Fleischer had to give up his piano career. Severe nerve and muscle injuries in his right hand eventually made it possible for him to play (he now conducts). There are examples galore in all countries, involving all instruments.

Every performance requires a great deal of physical effort. A concert broadcast on television clearly reveals this physical aspect in the heavily perspiring brow of the performer. Indeed, insiders know that it is not at all unusual for the musician to be soaked with perspiration after every performance and to have to change clothes. It may be said without exaggeration that the physical effort required of musicians can be compared with that of athletes. Everyone is convinced of the necessity of intensive and specialized physical training for athletic all-out efforts to be feasible. Only recently we began to realize that making music needs physical effort, which has to be taken into consideration before attention can be paid to the musical aspect of the piece to be performed. An exercise schedule, for this physical side of making music should be worked on, and this should be as specialized as for athletes and in just as conscious a manner. *Only when posture and movements have been trained consciously and have become conditioned reflexes, will it be possible to devote all attention to the music itself.*

Muscle movements are what making music is based on. To produce a note on a musical instrument in the most efficient way, a precise analysis must be made of the kind of muscle movements needed. Playing an instrument is often done intuitively, without knowing which muscles have to be used for a correct movement. It can be felt then that sometimes certain movements are not made in the most efficient way, often leading to complaints such as tendinitis, hypersensitivity, or tingling fingertips, among many others. The posture of the whole body is also extremely important, as incorrect posture can also lead to many complaints. Both posture and movement are effected by tensing or contracting, and relaxing particular muscles. Muscles are attached to the bones by means of tendons. The bones are interconnected by flexible joints. It is the task of the muscles to keep the bones stationary in a particular position, or cause them to make interrelated movements. Muscles do not function spontaneously, but are activated by orders from the central nervous system (brain and spinal cord). Some knowledge of the skeleton, the muscular system, and the nervous system is therefore indispensable for maintaining a good posture and making movements correctly, when making music.

At the start, my lessons are always aimed at explaining to my students how the body is built and how the muscles function. The student will then come aware of his body, he will get a conscious "body image". What is

also very important in my opinion, is that the student comes to my lessons with his instrument and music. I can then teach him while he is playing. In this way he will additionally form an idea of the relationship of his body to the instrument.

On earth we live counter to the force of gravity, which means that in order to keep our bodies upright in a standing or sitting position, there must be tension (tonus) in certain muscle groups. Some muscle groups are needed to keep the body upright and in equilibrium, and other muscle groups are needed for playing an instrument. The body is kept upright by the spinal column. Equilibrium, or balance, is achieved by tension (tonus) in some muscle groups on the front and back sides of the body that keep the spine in a fixed position. The spine consists of:

- 7 neck vertebrae,
- 12 thoracic (breast) vertebrae,
- 5 lumbar vertebrae.

Two muscle forces are always jointly operative on the neck and lumber vertebrae (12 in total) counter to the muscle force on the thoracic vertebrae. The latter force must be directed forward, which entails that the breastbone must be stuck out. This force, which works on its own, is the strongest. The other two forces, that work together, are directed backwards. This means that standing or sitting should not be done with a hollow back or with the chin sticking out.

In the neck and loin areas of the spinal cord, there are two large nerve centres, through which nerves pass to activate the muscles of arms, hands, legs, and feet. When these nerves are damaged due to a wrong posture, this may give rise to complaints in arms, hands, legs, and feet. Such problems, which are often experienced by musicians, make it difficult for them to play their instruments.

The nerve centres in the spinal cord are controlled by centres in the brain. Let us compare the activity of the brain with that of a computer. A computer only yields the desired result when it has been programmed correctly. As in a computer, a particular programme must be entered consciously into the brain, so that it can give the right orders to the muscles at a later stage. The muscles, in turn, have to learn to carry out these orders correctly, so that after some training these movements will have become reflexes. Exercises should really become part of the daily routine. Muscles have their own tension (tonus) which can be improved by regular exercise, thus making the muscles perform more smoothly. The conditioned reflexes of the muscles, however (i.e. the automatic answers of the muscles to the "brain computer"), also need a great deal of regular training. Musicians should be able to understand this better than anybody, since their daily ration of scales is primarily an exercise for the muscles of hands and arms.

The best thing to do is to start a working day with a set number of exercises before taking up the instrument. They should be carried out slowly and—particularly in the beginning—consciously. Afterwards, the movements will become automatic, as happens in sport and games. Preferably, the exercises should be done in front of a long mirror, so that mistakes can be spotted at once and corrected. For the same reason, it would not be a bad idea to practise music in front of a mirror as well. This has the same effect in a physical sense, as listening to recorded performances has in a musical sense.

initially, when practising in front of a mirror, musicians should concentrate on posture and movements rather than on tone, rhythm, or interpretation.

At first, it will even be necessary to carry out certain muscle movements with exaggeration to learn the desired result. Before one starts training in this way, one should be aware of the following: particular degrees of muscle tension are essential for maintaining proper balance, for playing comfortably, and so avoiding excessive tiredness or other problems. In order for my students to become aware of muscle tension, I teach them to tense and to relax muscles without moving. It is possible to tense a muscle enormously and be conscious of this tension. Then I tell them to relax the muscle, but not to move or sink in. The tension will then become less, but there must always be some tension to maintain the posture, although you practically will not feel this. In this way the students can gradually acquire a "feel" for muscle tension. This will be discussed at greater length further on.

Another observation about muscles: you cannot simultaneously bend our arms and stretch them. Muscles are either "flexors", or "extensors"; we try to use such "antagonistically" functioning muscles simultaneously, undue tension is created, which may lead to seriously aching muscles. For example, every musician knows that when he plays an instrument, the muscles in the shoulders must always be relaxed. In order to keep the shoulder muscles relaxed, we have to slightly tense their antagonists. But one has to be aware of which muscles they are before one can consciously give them a slight tensus. These muscles are located on the back. They are:

- (a) a muscle from armpit to hip (*Latissimus Dorsi*), and
- (b) a muscle that can bring the lower parts of the shoulder blades downward and brace them (lower part of the *Trapezius*).

As we have said before, there are muscles whose function it is to keep the body in balance and there are other muscles that we use when playing an instrument. If the muscle groups needed for the balance (posture) of the body are not used correctly, the "playing muscles" must come to their assistance to keep balance. The group of the playing muscles then have to do extra work, which may create severe stress when playing—purely *physical* stress. It is therefore essential that every musician knows exactly which muscles are used for *balance* and which for *playing*.

There are two groups of *balance muscles*, one at the back of the body: the muscles of the nape of the neck and of the back, the buttocks, all leg muscles, and the foot muscles. The other group is located at the front of the body: the belly muscles up to the diaphragm for those who do not need their breathing for playing their instrument and the belly muscles up to the navel for those who do need their breathing for playing their instrument.

The *playing muscles* are located at the front of the body only, from the diaphragm or from the navel. They are the upper belly muscles, the breast muscles, the neck muscles, arm and finger muscles and the muscles in the shoulders. A range of various specialized exercises are aimed at consciously learning to distinguish between *balance* and *playing muscles*. The balance muscles of musicians have to be trained so that their condition improves, just as the muscles of athletes.

When building up a standing posture with the balance muscles, we always start from the bottom. We could compare this with the building of a house. Then, too, one starts with the foundations and not with the roof.

The feet point almost straight forward and are placed a little apart. The weight of the body rests in the middle, the angle between the feet and the legs must be 90 degrees or less. The knees remain flexible, not locked. The pelvis is tilted backward and the belly muscles are tensed. The whole back must be completely straight. The breastbone is brought forward and we bring the shoulders back a little, and slightly contract the lower shoulder blade muscles. The head is in one straight line with the spine. The crown is the highest point. This way one is well in balance. Some musicians have to stand for a long time during performances and for them foot exercises are particularly important as fallen arches can be a serious handicap. Fallen arches are often the root cause of many seemingly unconnected complaints, such as pain in the neck and the head. Standing well on both feet gives a balanced posture and prevents a great deal of discomfort.

In order to be able to sit well, we must in the first place have a good chair at our disposal. It must preferably have a straight, horizontal, hard seat. The chair need not have a back. The seat must be at such a height that when sitting on it, the upper legs point downward a little; the angle with the groins must be slightly more than 90 degrees. The feet must be placed directly under the knees, not under the chair. One has to sit on the sitting bones with a straight spine, the head in one line with the spine. The shoulders must be relaxed, pulled back and aslant a little, with the lower parts of the shoulder blades a little braced, as in the standing posture. Even when *the chair is bad*, one still has to aim at as *correct a sitting position as possible*.

Also when using the playing muscles, people often make mistakes. For this purpose, too, specialized exercises must be done, the brain computer must be programmed correctly. In order to be able to "programme" his brain, the musician needs to have learned which muscles or group of muscles are needed to carry out certain movements correctly. I shall provide some examples to clarify this. The first example has to do with the embouchure of the flute. The flute rests on the lower lip. When forming high or low tones, the opening between the lips changes. The lips are surrounded by a sphincter, on the lower part of which the flute rests. To modify the opening between the lips, the muscle of the *upper* lip must be used. If one tries to achieve this effect with the muscles of the *lower* lip, the jaw is in danger of being moved incorrectly. Sometimes this causes serious complaints in the jaw joint immediately, but often not until later in life.

Just how important it is to use the muscle groups correctly in order to overcome particular technical difficulties is further illustrated by the next example. Some string instrument players have problems in making a spiccato. A good spiccato is achieved when *not only* the arm muscles are used, but also and especially when involving the muscles of fingers and wrist. When studying a spiccato one even has to begin by keeping the forearm still and by *using only the small muscles*, the movements of fingers and wrist. These movements of wrist and fingers must at first be exaggerated for practice. Only when one is able to feel what those muscles have to do (when the brain computer is programmed to the purpose), the forearm joins in and spiccato will automatically ensue. Speed in spiccato is achieved by the correct use of the small muscles (fingers and hand); big muscles (arm) cooperate, but cannot develop speed of their own accord. Finally, for pianists: *the wrist must remain flexible and should not be stationary*. The fingers, too, must be moved as flexibly

is possible in all directions. When wrist and fingers are not flexible enough, the arm muscles are too tense, often causing complaints.

What applies to every instrument is that some movements are carried out more easily and more naturally than others. This is called the *physiological rhythm of the body* and it should be put to advantage.

For example, when the right wrist bends to the left, the fingers also bend little; when the wrist bends to the right, the fingers are a little stretched. If one acts counter to this principle, undue tension is the result. Likewise, if the wrist is bent outward, the fingers are bent too tensely, if the wrist is bent inward, the fingers tend to bend more supply. When playing the piano, the finger joints and the wrist have to be gradually flexed forward, so that a relaxation is created in the arms. If we do not flex the fingers and the wrist forward, but pull the fingers back to the body, tension is created in the arms. There are many more similar related movements that should not be altered.

Another frequent mistake is lifting the fingers *too high* (this applies to every instrument). This causes undue tension in the muscles needed for that purpose, which may lead to complaints. The important thing, namely, is not the *lifting* but the *putting down* of the fingers. In the case of the piano it is the way the fingers are put down which accounts for pianissimo and forte. In the case of string instrument players, the fingers of the left hand are only *put down* to create a particular *pitch-level*. Putting the fingers down does not affect differences in *tone force*. The greatest pressure occurs in *vibrato*.

Brisk movements are sometimes made with the bow or when playing the piano or any other instrument. These brisk movements are caused by the inability of the musician to regulate the force of the muscle tension accurately. As a consequence, he makes uncontrollable movements. Everyone will probably occasionally have experienced something like that in daily life, for instance when you want to lift something you think is very heavy but turns out to be quite light. The muscle tension you create then is not adjusted to the situation. We would like to refer back at this point to the exercises we discussed that are useful in becoming aware of muscle *tonus*.

What has been said so far demonstrates that every musician should not know most precisely which muscles he must use, but also which muscle tension is needed to play his music correctly. When he goes against this, problems will no doubt arise and stress is bound to follow. Almost every musician unconsciously creates extra and unnecessary tension when playing. When this kind of tension occurs in the *playing muscles*, this may unfavourably affect the way of playing. Unfortunately, such additional muscle tension is hardly ever avoided completely. However, if one learns to create tension in *balance muscles*, for instance in the buttocks or the foot or back muscles, the playing muscles will not be overloaded and the way of playing will thus be freer. Additionally, nervousness occurs in artists who are not entirely aware of their technical qualities when playing a particular passage. They do always have a physical awareness related to the technical difficulties in a piece. And yet, those technical difficulties could be overcome by combining a *specialized movements programme* with the *musical preparation*. To that, a higher degree of self-confidence will be attained and an important of the nervousness will disappear.

Not only the technique of playing an instrument, but also the entire performance of musicians on stage can be favourably affected by a growing

awareness of posture and movements, i.e. of muscle functions. This is not a question of "suddenly realizing something", but rather a development of physical confidence in the course of a special training programme, which can help to diminish that part of stress that is caused by physical tension. Extreme nervousness before a performance may also be relieved by such a programme of exercises. The so-called "warming up", and the actual performance, would benefit from such exercises beforehand *without* the instrument. These exercises have to be learned to a point of proficiency and that is why one has to work through a special practice programme regularly. The exercises consist of consciously tensing and relaxing muscles accompanied by correct and deep breathing.

Breathing is always very important to every musician, for every time a musician has to overcome a difficult passage he will be inhibited in his breathing. It is very important that he is taught controlled, continuous breathing. Sometimes breathing is audible during a performance, which can be most annoying for the audience. Such a noise is caused by a tightening of the nostrils. The best thing for the teacher to do then is to ask the student to think of something really wonderful to smell. The student will then learn the use of the muscles that open his nostrils. After certain exercises, this programme will be stored in the brain computer and the musician will refrain from making any noise.

So far, a wide range of general exercises has been discussed that should be practised by every musician. Doing physical exercises every day without fail is the only way to master them and to arm oneself against all kinds of physical stress. Such a training must be conducted under expert guidance. At a later stage one may very well be able to impose discipline on oneself. Besides the general ones, there is of course a variety of specialized exercises aimed at playing the different instruments. I have discussed this extensively in my book "*Muscle Control for Musicians*", (Bohn, Scheltema and Holkema, Amsterdam, 1980).

Ever and again it surprises me that the *physical aspect* of making music is much neglected. This is probably due to the slight attention we pay at posture and movement in everyday life. Let us take a look at how the body of a human being develops as it passes through various stages, from lying down as a baby to sitting up, then to standing, and finally walking. By the age of 2, a normal child will usually be able to walk. Up till then everyone has probably been full of admiration about the child's achievements. Strangely enough, however, nobody pays any attention anymore to the development of its movements after this stage has been reached. When a child starts to talk, it is sent to school for its verbal development. It learns how to read and write, but nobody hardly ever pays attention to its posture and physical development anymore. Most people are never made conscious of the way they move. Only to sportsmen the conscious use of their muscles is of special importance and so this is taught to them. Most musicians, however, are not at all "muscle conscious", nor are they ever trained to be so. *This type of training should nevertheless be an integral part of the curriculum in academies of music.* Music teachers and physical trainers (physiotherapists) should work closely together in this. The physical demands that each instrument makes on the musician—*different demands for different instruments*—must, of course, be known in detail to the physiotherapist. Only when the physical training

is become routine, will there not necessarily be cause for pain when musicians, be they professional or amateur, play their instruments and only then will the physical part of stress cease to exist. Therefore, I am wholeheartedly convinced of the truth of the following train of thought: "if I experience my body image more consciously and if I can learn to control my muscles, I will be able to use my body more freely when I am performing, which will at the same time enable me to create a more beautiful tone. I will then achieve a more conscious relationship with my instrument and arrive at a freer phrasing and more fluent way of playing. The result of this freer use of my body is that I will be less inhibited and that my attention will be more freely directed at the music I play, so that I will be able to create an over-all better musical interpretation". This will, in turn, result in stronger resistance to stress symptoms. Because of a lack of insight into the physiological aspect of stress among performers, artists are often treated too carelessly and as a consequence a lot of energy and talent is often squandered.

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MUSIC MAKING AND OVERUSE INJURIES

by Hunter J. H. Fry, M.S., F.R.C.S., F.R.A.C.S.

Introduction

This Society is concerned with the untoward effects of tension. Tension may be mental or physical. My concern in this presentation includes physical tension brought about by excessive and unco-ordinated muscular contraction during playing. This is one of the three factors producing overuse injury. The condition of overuse injury is becoming more accepted as the term to describe these physical consequences. Firstly, "overuse" appears to be appropriate since the condition is brought about by what appears to be excessive use of the muscle units. The term "injury" is certainly applicable for the more severe examples where there is demonstrable tissue damage in both muscle and joint ligament which have been taken beyond the limits of mere fatigue to a point of damage. In the less severe examples, tissue injury is probably minimal, yet since it is an earlier stage of the same process, so inclusion under the umbrella term "overuse injury" would seem to be reasonable.^{1/2}

Overuse injury may be defined as a painful condition of the upper limb produced by hard, intensive use of the limb and use which is excessive for that individual. Musicians may be interested to know that people in other occupations which are hand-use intensive, contract the identical condition. This includes secretaries using word processors or other fast electronic keyboards, assembly line workers or process workers in industry, writers (the old fashioned "writer's cramp), and recently it has been described in potters.³ The common factor here appears to be the intensity of use of the hands and the upper limb in general. The physical signs in the hand and wrist which indicates tissue damage have been described.¹ The legal implications of loss of function of the hand from these causes have been detailed.⁴

The commonly used synonym in the United States and United Kingdom for the condition of overuse injury is tendinitis and tenosynovitis. There are some further variations.

Tendinitis, Tenosynovitis

By common acceptance over many years, these terms have been used for overuse injury. These terms mean inflammation of tendon and tendon sheath, and these conditions are both specific and verifiable. The reason for the adoption of these terms is obscure. In both the hand and the foot, true tenosynovitis does exist, and this can be acute or chronic. The symptoms (complaints by the patient) can be matched up with the structures concerned (tendons, tendon sheath), and the examining surgeon can clearly locate the trouble in the tendons, whether this be on the front or the back of the hand. At operation in true tenosynovitis deviation from normal can clearly be seen and indeed is usually quite photogenic. The forms of tenosynovitis familiar to the surgeon usually involve removal of some of the abnormal tissue at operation and the conclusive microscopic details are seen when the tissue so removed is sent to the laboratory to be examined by an expert under the microscope.

One consequence of this label of 'tenosynovitis, tendinitis' is that a number of musicians have been submitted to operation in the hope that removal of the sheath will leave the tendon free to glide. Opportunities have been therefore provided on literally hundreds of occasions for inspection of the supposedly affected structures and for biopsy material to be processed. No published paper on the subject has there been photographs of the supposedly inflamed structures or photographs of the microscopic appearance of biopsy material. Unless some evidence comes to light these terms should no longer be used since they are incorrect.

Not only is the pathology not proven, but repeated surgical intervention is disproved it.

One might say "does it matter?" It probably does matter. Many patients have their symptoms for years, and will try anything to get better. The term 'tenosynovitis and tendinitis' encouraged surgical intervention since in the few verified examples of tenosynovitis, surgical intervention is usually highly effective. The belief that this is an inflammatory condition encourages the use of anti-inflammatory drugs. While tissue damage may be associated with the release of some substances which themselves appear to have an inflammatory effect, overuse itself is not in the main, affected favourably by anti-inflammatory drugs. At the time of writing, the number of musicians with overuse injury in my series is in excess of 460 individuals. About one quarter that number had already been treated with anti-inflammatory drugs. These musicians when questioned indicated that these drugs made little difference to their basic condition for the most part, and usually made them feel sick or uncomfortable. This study indicates therefore continuing to use these terms acts in a negative way in therapeutic endeavours which at best, can only be "hit or miss".

In consideration of the prevention of overuse injury, it is not really possible to work out effective, logical preventative measures unless the basis of the injury is known. It affects the musculo-skeletal system.

The Musculo-Skeletal System (Good for lecture to music students)

All tissues of the human body function within quite narrow tolerances. They can only stay alive in a certain temperature range, and all manner of other tolerances of this kind exist. The inner ear is damaged at excessive sound levels, excessive amounts of light will damage the eye, excessive force will tear the skin and so on. The musculo-skeletal tissues are not exempt from such strictures.

The bones form the rigid skeleton and movement of the body occurs at joints where the bones are joined up to each other by fibrous ligaments. Even in ordinary walking, considerable force is transmitted from one bone to another through these ligaments. Deep to the ligaments there are special cartilages facing on the joint and a thick fluid is secreted into the joint by a membrane. Inflammatory diseases of these joints are known as 'arthritis'. The bones are clothed with muscle. It is the muscle tissue which does the work. It is capable of shortening its length, and this makes the joint move. All active movements the body performs are brought about by muscular activity except for purely passive movements in response to gravity.

Muscle

It is important to understand that muscle represents stored-up energy a little like a car battery. When the muscle is used for mechanical energy expenditure, it is like running the battery down. The chemically stored energy in the muscle cells is translated into released mechanical energy and heat. For moderate muscular activity oxygen and glucose are required from the blood to rebuild the stored energy units. In such moderate activity, even the increased blood supply which is automatically provided to working muscle, does not allow the energy to be restored at the same rate as it is being used up. The muscle therefore goes into debt, not only of oxygen, but of other chemical substances which, after muscular activity ceases, are restored at variable rates. In a single performance act over a short period of time, excessive use of muscles is cut short by pain developing within those muscle groups. This might be looked on as nature's way of preventing us damaging ourselves by excessive use of our muscles. When the use of the same muscle groups, for instance in the upper limb, occurs over a number of hours each day, the pain from overuse may occur many hours after the excessive use, because nature's warning system has in some way been altered. This is precisely the risk which is being run by a musician playing or practising for long hours without resting the muscles and it is important that the musician should realise that here nature is locking the door on the stable after the horse has bolted.

Muscles can damage themselves from their own contractions, and when they do, those muscles become painful. In the case of the musician, suffering from an overuse injury, such muscle damage is seen particularly in the hand, working small muscles of the hand which flex the first bone of the finger on the hand, and spread the fingers to position the fingertips during playing. The process however may involve injury to the muscles of the forearm, upper arm, shoulder or shoulder blade and neck area.

Brass and wind players may suffer muscular overuse in the muscles of the mouth, resulting in an incompetent embouchure. Some wind players particularly oboists and trumpetists may suffer muscular failure of the soft palate so that the seal between the roof of the mouth and the floor of the nose becomes incompetent, allowing air to escape through the nose. The latter injury is far less serious than the former.

The tendon of a muscle fibre does not itself contract and is the strongest part of the unit. In retrospect, it seems curious that it was thought to break down first. There are two particular muscle groups (forearm extensors and the triceps of the upper arm) which appear to show maximum tenderness at the musculo-tendinous juncture which is probably near where the damage occurs.

Joint Ligaments

These are tough fibrous structures joining the bones together at joints. Any weight lifted by the hand for instance, is transferred through the ligament of each joint of the upper limb until it is loaded directly on the spine. Clearly these ligaments do not have the strength of bones, but so long as loading is not excessive, they perform very satisfactorily. They suffer the direct tensile loading (i.e. stretching) when they are bearing weight, or suffer repetitive deformation with many of the fast movements of music making.

They are adapted for these two functions, but as with all tissues, have an upper limit. Joint ligament is a pain sensitive structure. If it is damaged by excessive stresses either acutely or chronically, it will become painful. Ligamentous damage of this kind occurs in athletes and dancers as well as musicians. Normal undamaged ligament is not tender, and when the surgeon examines the musician's hands which are painful from overuse, some ligamentous damage is invariably found. The joint right at the base of the thumb within the hand itself is perhaps the most common ligamentous structure to be affected, but on the same side of the wrist joint itself, the ligaments are commonly tender in overuse. Many joint ligaments in the hand can sometimes be affected and it is necessary to distinguish this form from the diseased condition of the joint itself. How then is the musculo-skeletal system affected by music performance? What of muscular tension?

Muscle Tension in Performance of Music

This is generally acknowledged to be counter-productive. The reasons are not difficult to understand. For the skilled execution of movements required by music making, joints must be stabilised as well as moved. If there is any excessive or unco-ordinated muscular activity across one side of a joint, then it must be balanced by an equal amount of unwanted muscular contraction on the other side to keep the joint in the same position. Since muscle groups often cross more than one joint, this may have a snowballing effect, so that many more muscle fibres are called into action. Once this situation has risen however, it takes more muscular effort to move the joint in any direction since there is tension on both sides of it instead of free low resistance movement. In addition, the excessive tension loads further the joint ligaments more than what is necessary. This will mean that the joint will require more work on behalf of the executant muscle and because of the tension response will be slower. The result is loss of the top edge of the technique.

While we have been discussing mainly repetitive movement in which each muscle group usually has brief relaxation phases, potentially far more amazing is sustained muscular contraction used to hold up an instrument such as the trombone, the violin or the french horn. The worst examples are seen in the sustained muscular contration and loading of the joint ligaments by hanging the clarinets and oboes on the right thumb, which exercises highly geared leverage on the joint ligaments at the base of the thumb, and in cause an overuse of the little muscles joining the thumb to the side of the hand. The special dangers of static loading and sustained muscular contraction are dealt with elsewhere.⁵

Teaching and Misuse

Many music teachers believe that if the teaching is good, and if the student is played the 'right way' overuse will not occur. Since overuse is unfortunately very common, free discussion of the problem is somewhat gagged by these views. The music teachers blame each other, a given music teacher may feel that the student who has an overuse injury has disobeyed instructions, and is guilty of 'misuse'. The end result is that teachers become defensive and students become secretive because they do not know who they can talk to.

There are a number of books written on piano teaching. The following remarks probably apply to other instrumental teaching as well. It is very clear reading books of piano taching methods, that the author believes that he or she alone is 'right', and that all others are wrong. There is only one way to play the piano 'correctly'. Any other method is 'incorrect'. Since all of these methods are therefore virtually exclusive, we have the 'reductio ad absurdum' proposition that they are all wrong, because every book has been voted wrong by the others! Experience tells however that widely differing methods of teaching seem to produce excellent results in the better students, and some students develop freer and more effortless techniques than others, and that some students are simply more gifted than others in this direction.

If one looks at the technique of Horowitz, Ashkenazy or Iturbi, the use of the hands is quite different, yet they all represent a standard of excellence which make a mockery of the propostion that there is only one 'right' way to play. To a mere surgeon's eye, what these three players have in common is that unnecessary muscle action is avoided, and that extremes in the range of movement of any joints are avoided because of the effort required to put them there let alone hold them there. The principle of avoiding overuse of the body in the technical execution of music making is in the main simple, rather than complex.

Allegations of 'bad teaching' have not widely been found in my studies, but this is not the same thing as saying it does not occur. I have not found that teachers deliberately encourage excesses in their students, at least not in Australian music schools, do they tell their students to "practice till it hurts". While teaching skills are very difficult to measure, the capacity to impart knowledge depends so much on the relationship between the pupil and the teacher. Fear of the music teacher is often a factor operating against the student reporting pain on playing. In general terms however, any mistakes made by the music teachers are those of omission, and it is the responsibility of the medical profession to bring the information before the music teachers, so that it can be properly considered.

Occasionally music schools appear to take the view that 'survivors only' is the easiest, most satisfactory, and cheapest policy to apply. Unfortunately overuse injury can occur to the great and the famous long after they have left music school, and the evidence from my study indicates, at least to this date, there is no direct link between excellence of performance and achievement generally on one hand, and the capacity to withstand excesses of physical activity on the other. (see later).

There are music teachers and music educators who regard the notion of supporting the weight of a musical instrument by the players, as being a 'normal' activity, and that an attempt to make an instrument weightless, thus relieving the static loading, is 'abnormal'. It is our duty as medical practitioners to ask the music teachers and music educators to consider these matters anew. Available evidence would favour the notion that overuse injury in the music school is theoretically preventable, we are bound to make music teachers more aware of the importance of the general health of the music student, the importance of posture, of building a good set of spinal muscles, of balanced activity and use of the body away from the instrument, of body awareness and control with such ancillary measures as Alexander, Feldenkrais, Yoga and relaxation techniques and other means.

Misuse

A teacher in a music school will have a group of students showing a spectrum of ability. Their musical capability and their capacity to withstand physical excess, may not necessarily coincide. These matters are at least in part determined genetically. An overuse injury in a music student generally occurs at the time the practise load is raised for examination, competition or recital. Amongst students with overuse injuries, there seems to be a mixture of those with the effortless technique, some with a tense technique, some with small hands, some with large hands, and music teachers would lump them together with the accusation of 'misuse'. This term would seem to me somewhat intimidatory, placing the responsibility on the student, not only for lack of success as compared with his more gifted fellows, but also for the injury. Available evidence would indicate the only 'misuse' the student is guilty of is excessive zeal.

Three Factors in Overuse Injury

In my studies in Australia I found that overuse injury occurs at least in one in every 20 students at music school, and a true incidence is nearer one in four. Although many of these injuries may not be serious if treated appropriately, this incidence is high by any standards. In symphony orchestras where there is intense competition for jobs, the incidence of overuse injury is even higher and this unfortunately seems a logical extension from what happens in the music schools. This cannot be explained by 'doing it the wrong way'. The following is an attempt to dissect the factors which have come to the surface in my own study.

i) The Genetic Factor

Everyone living in the past or present is a genetic 'once off'. We inherit genes not just from our parents, but from all the generations preceding them. We vary in our capacities, in our gifts, in our endurance and in how robust we are when challenged physically or mentally. This genetic factor is very obvious in the area of sport, and there are many parallels between musical performance (upper limbs) and the marathon (lower limbs). There is much evidence to suggest that some musicians are simply more genetically robust than others. One musical example illustrates the situation well. Forty school children around the age of 15 years play clarinet at the standard of A.M.E.B.* Grade 6. They would practise for about an hour to an hour and a half per day. When they go to music camp for three weeks, they are playing around 8 hours per day, quadrupling their playing time. The most important factor in overuse injury in clarinettists is the 800 gram weight of the B flat clarinet hanging on the right thumb.^{2,5} As time goes on, even amongst those young players who are not there primarily to complain about the problems of music making, the injured right thumbs will be reported one at a time. Is it possible to tell who will suffer breakdown and who will not? Unfortunately it does not seem to be possible to tell in advance who will break down first and who will break down last, for if one pursues this proposition to its ultimate conclusion, if all these clarinettists hung the clarinet on the right thumb for long enough, all of them would suffer tissue damage. The evidence from music camps would support this proposition. There are more reported injuries after two weeks than after one week and so on.

Australian Music Examinations Board.

(ii) Technique

This factor in relation to overuse is often considered by music teachers to be the only factor, and has, I believe, been somewhat overdrawn. It is equally unfair to over-react and say that it does not matter! There is little doubt that it is no help to the aspiring musician or the practising musician to engage in excessive muscular activity and joint loading, to achieve any given musical result.

(iii) Total Use

My own study would indicate that the total use of the upper limb (or the mouth in the case of some wind players) is the most important factor. Great and famous people who practice too much can suffer an overuse injury whose previous history indicates that they are genetically robust and they have a supreme technique. The correlation in music students is close to 100%. Overuse injuries in music students begin when the practise load is raised for examinations, assessments, competitions and recitals. It can also occur after a vacation when the resumption of practice is not graduated sensibly and the muscles and ligaments cannot adapt quickly enough.

Clearly a competent music student's technique does not change substantially with the practise load being raised, although interestingly enough, once the muscles become damaged, tension may increase noticeably. This may be because the student tries to practise harder to recover lost ground, or it may occur because damaged muscles suffer an interference with the relaxation phase which is the beginning of a vicious cycle.

While acknowledging the importance of the way an action is carried out, it is not easy or comfortable to accept the proposition that any music student or performer as long as they are playing 'the right way', can play or practise each day for an indefinite length of time without risk of overuse injury.

Severity of Injury

Severity of injury is graded on a scale of 1-5 as follows:

Grade 1 Pain in one site when playing. This occurs with ordinary use, the pain stops when playing stops.

Grade 2 Pain in more than one site when playing. Perhaps loss of some co-ordination, absent or minimal physical signs. Possible loss of 'top' of concert artist.

Grade 3 Pain when playing in one or more sites, may persist away from the instrument, but begins to affect use of the hand outside of music making. Student under performs, orchestral player suffers pain on rehearsal performance which is usually unrelieved.

Grade 4 Loss of function of the hands (or equivalent) involves multiple uses of the hand or upper limb, usually involving such matters as driving, writing, turning taps on and off, housework, hobbies, gardening, so that while function is impaired by pain it is not prevented so long as the pain level is tolerated. Some orchestral players "hang on by their fingernails". Pain at rest or at night in this state. Music students are experiencing great difficulty in continuing their course.

rade 5 As Grade 4, except that capacity is so reduced that orchestral players can no longer carry on and must resign their position. Students have generally had to drop out of their course despite their love of music. Loss of function of the hand (or the mouth or the spine) is obvious and acknowledged except by the most cynical. Pain at most times.

The age distribution and details of the series in my own study have been detailed elsewhere, and the musician is referred to these publications.² suffice it to say however, that 10% of my series have had their overuse injury for longer than 10 years, and the peak in incidence is between two and five years. Spinal pain at least at one level occurred in over 50% of the series, and string players were disproportionately represented (nearly 50%), woodwind players (just over 20%), keyboard players (under 20%) with brass players about 10% and percussionists just under 5%.

Treatment of Overuse Injury

This must be based on the cause. In my study there was no support for the proposition that pain was some sort of conversion hysteria⁶ which had no basis in reality.⁷

Musicians may suffer from nerve entrapment syndrome, true tenosynovitis, osteoarthritis at the base of the thumb, thoracic outlet syndrome, reflex sympathetic dystrophy, ulna nerve neuropathy, but these are specific conditions which can be accurately diagnosed and treated, and good results are expected. These conditions do not have anything to do with the overuse which is so common amongst musicians.

Overuse injury is said to be inflammatory. Calabrese⁷ states that this is an inflammatory condition quoting the physical signs of swelling, redness and pain with tenderness. He also claims that the condition responded to anti-inflammatory drugs and that the side effects were minimal. He quoted a series from answers to a questionnaire from the Cleveland Clinic indicating a high incidence of spinal pain,² but in my study I was unable to confirm symptoms and signs of an inflammatory process, nor the response to anti-inflammatory drugs.

Dawson⁹ recommended a rest period of six weeks after which the hands were splinted for a time during each day, and then were taken out of splints and exercised.

It was acknowledged that this produced pain and questions from the teacher suggested that the afflicted musicians had to be strongly motivated to pull themselves through this amount of pain. Dr. Dawson did not discuss the results from this form of treatment.

From my study the best results were obtained by a programme of total avoidance of Pain Inducing Activity. This was carried out on the basis that going pain was in fact damaging to the already injured structures, and that total rest occurred, the injured structures could heal. The results from this are incomplete, but highly promising and have been reported elsewhere.²

Reduction of Static Loading

Tension in performance from totally unnecessary muscular activity can be relieved by taking the weight of an instrument off the right thumb or the hand or the upper limb.

Prevention

1. Practice

Available evidence suggests that it is better to practise in short segments of about 25 minutes and then rest muscles for about five minutes. While the music student or player may not feel anything happening in his muscles over this period of time, considerable restitution is occurring and after such a respite, the muscles are more responsive to programming when practising difficult works with repetition.

2. Static Loading

Despite the prejudice of existing practitioners whose genetic constitution has allowed them to survive static loading over many years, there is greater safety if the static loading is relieved and without the tension of say an 800 gram clarinet on the right thumb, technique is immediately improved. Is this not an attractive proposition?

3. Communication

It seems important that teacher and student should have some sort of mutual respect. If this does not occur, the teacher cannot possibly get the best result in that particular student. For the same reason the student cannot develop fully and express any individuality.

4. Education

Grasping the nettle is always difficult, and this is why pioneers are usually respected after they are dead! Students should be able to have lectures on overuse injury. These lectures should contain material which enable them to make good decisions when they are away from the supervision of the teacher. This will give them some sort of intellectual armour which will hopefully present sufficient information to allow them to protect themselves from overuse injury. At Eastman School of Music a booklet is available to students on a hand out basis.

5. Teaching

Teaching on posture, body awareness, physical well being and general health will improve and help protect the music student.

Conclusions

Teachers and students alike should realise that overuse injury is serious, that it costs a great deal in terms of loss of or damage to the career of gifted students. It may also impair or lose the career of gifted performers.

The following suggestions are made to avoid damage:

1. Do not practise "until it hurts". Evidence shows that such students may convert to a higher grade of injury.
2. If you are holding up an instrument, find a way to play that instrument so you do not have to hold it up.
3. Be careful about drugs and operations, overuse injury may mimic conditions which are legitimately treated by operation.
4. A period of rest is very disruptive and may last months rather than weeks. While early injuries may be satisfactorily treated by trouble-shooting techniques, elimination of static load, attention to general health and other matters, most Grade 3 to Grade 5 injuries do require rest to enable injured tissues to heal. This could mean one year away from performance studies.

If after a period of rest the student is free of symptoms and free of physical signs (tenderness in damaged structures) resumption of music

making has to be *infinitely gradual*. It is very easy to cause new damage in recently healed structures. The injured musicians must look at the long term rather than the short term convenience.

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"MUSICSAFE"† CLARINET POST*

CATALOGUE No. HF1

This device was developed out of medical research into the illnesses and injuries of musicians. It has been developed with the help of clarinettists working with the Survey Director. The B-Flat clarinet weighs approximately 1.5 kg and is conventionally borne on the right thumb. This produces a high incidence of overuse injuries which may be difficult to treat and may even terminate the clarinettists' career. Most of these overuse injuries are directly attributable to the clarinet weight being borne by the right thumb. This post, which is convenient and easy to use, renders the clarinet weightless so that excessive strain is removed. This makes the clarinet as safe as the piano. As regular, moderate practice habits are observed there should be no

danger of overuse breakdown. Children, especially vulnerable to such injury, may thus safely learn the clarinet from an early age.

An improvement in technique will result from using this post because of the disappearance of tension in the right thumb and wrist area. An improvement in tone may also result in most instances.

The post is fully adjustable, comes with its own double sling for stability and adjustment. Harness straps are available, if required. It is inconspicuous and is recommended for all clarinettists. A small fitting is required on the under surface of the clarinet to articulate with the top of the post and this can be tried out in various positions with double sided adhesive. When the best position is achieved, this usually being a little distance towards the player from where the thumb rest is, fitting maybe screwed on permanently. A player may wish to keep the thumb rest on for orientation, at least initially, but after a time will probably elect to discard it.

*Registered Design †Trade Mark applied for

CLARINET AND OBOE SUPPORTS



"MUSICSAFE"† OBOE POST*

CATALOGUE No. HF2

This post was developed, like the clarinet post, from medical research into the problems which came from oboe playing. It renders the oboe weightless so that the static loading on the right thumb is removed and releases the right hand from the tension. This results in an improvement of technique as well as making it a safer instrument to play. Overuse injuries occur in oboe players, as in clarinet players, and again is attributable to the static loading on the right thumb from the weight of the instrument.

The oboe post is longer than the clarinet post and should articulate on the bell side of the thumb rest. At the point of balance in the playing position of the instrument this is approximately 3-4 cm. further down the oboe. Articulation is also with a small ball and stalk fitting which can be tried out in various positions by double sided adhesive. Once the definitive position is chosen the plate maybe screwed into the bottom of the instrument. A neck strap is supplied with the double sling and harness straps are available also.

*Registered Design †Trade Mark applied for